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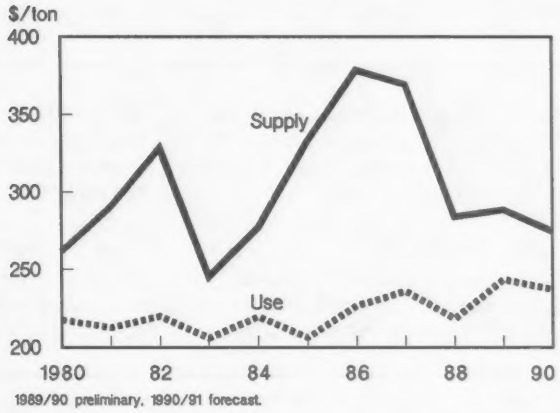
Situation and Outlook Report

Feed Grains: Supply and Use



1989/90 preliminary, 1990/91 forecast.

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Summary

U.S. and foreign coarse grain production are forecast up around 3 and 2 percent, respectivley, from 1989/90. However, both U.S and global use are forecast above production and stocks are projected to drop for the fourth straight year. Larger crops in several key importing countries, especially the USSR, and competition from wheat used as feed are expected to sharply reduce world coarse grain trade from its second highest level in 1989/90.

U.S. feed grain disappearance in 1989/90 is forecast at 242.4 million tons, up 11 percent from a year earlier. Food, seed, and industrial use (FSI) will be up about 3 percent, and exports and feed and residual disappearance are expected to rise around 13 percent each. Ending stocks are forecast at 46 million tons, down 30 percent. Farm prices will average about 8 percent less than in the 1988/89 drought year.

Corn disappearance for June-August is expected to run about 1.5 billion bushels, bringing total use for 1989/90 to a just over 8.1 billion bushels. For the year, exports of 2.35 billion bushels are forecast up 16 percent, the highest since 1980/81, and domestic use of corn will be up around 10 percent. Carryout stocks of corn are forecast down 600 million bushels to 1.33 billion. The farm price will average about $2.38 a bushel, compared with 1988/89's $2.54.

The 1990 corn crop is forecast at 7.85 billion bushels, 4 percent above a year earlier. The crop still lags in development, leaving it prone to losses from an early frost. The larger crop will offset about half of the expected drop in beginning stocks, resulting in a forecast supply for 1990/91 of 9.2 billion bushels, almost 300 million below 1989/90.

Corn disappearance for 1990/91 is forecast at 7.98 billion bushels, about 2 percent less than expected in 1989/90. Domestic use is forecast up about 120 million bushels, but exports are expected to drop about 275 million. Ending stocks are forecast to decline nearly 10 percent to 1.2 billion bushels, the lowest since 1983/84. The ending stock-to-use ratio of 15.1 would indicate a tighter supply than in 1989/90 when the ratio was 16.4. Thus, the season-average farm price for 1990/91 is forecast to range from $2.35 to $2.75 a bushel.

Food, seed, and industrial use of corn in 1990/91 is expected to rise 3 percent from 1989/90. Most of the increase likely will be in wet milling corn sweetener and ethanol output. Dry milling use is expected to be about the same or up only slightly.

The 1990 sorghum crop is forecast at 547 million bushels, 71 million below last year's crop. A yield increase of 3.7 bushels per acre will fail to offset a decline in harvested area. Carryin stocks are forecast down sharply, leaving 1990/91 supply at 799 million bushels, down 24 percent from 1989/90. Use is forecast down 16 percent to 680 million bushels. Because the lower use will still surpass the expected crop, ending stocks are forecast to fall to 119 million bushels, the lowest since 1976/77.

An increase in forecast barley yield of 3.4 bushels to 52 bushels per acre will just offset a 7-percent reduction in expected harvested area, leaving the 1990 crop virtually the same as last year's 403 million bushels. Ending stocks are forecast to drop to their lowest level since 1976/77. Expected production gains in malting barley have already narrowed the gap between prices for malting barley and feed barley.

Oat production for 1990 is forecast at 365 million bushels, marginally lower than in 1989/90. Larger beginning stocks are expected to more than offset declines in imports and production, so the 1990/91 oat supply is forecast at 568 million bushels, up 4 percent from a year earlier. Oat prices are expected to fall below the 1989/90 average.

Hay area indicated for harvest is down 1.7 million acres in 1990/91, but yield gains are forecast to push production 3 million tons above 1989/90 to 148 million. Timely rains have benefited the crop in most major hay areas, including Wisconsin, Minnesota, North Dakota, South Dakota, and Nebraska. Alfalfa production is forecast up 6 percent, but other hay production is expected down about 3 percent from 1989/90.

Transportation services are expected to be generally adequate during the 1990/91 crop year despite the planned early closing of the Missouri River to navigation on November 1. Although grain and soybean disappearance is projected to be only slightly below 1989/90, the patterns of use suggest reduced demand for rail and barge service.

World coarse grain production is projected to rise 2 percent in 1990/91 to 817 million tons, the highest in 4 years. While consumption is projected to be virtually unchanged at nearly 826 million tons, it will still exceed production, drawing down stocks for the fourth straight year. However, the anticipated 8-million-ton reduction will be much smaller than in the 3 previous years.

Foreign coarse grain production is projected to rise 2 percent to a record 590 million tons. Significant gains are forecast for a number of critical importing countries, especially the Soviet Union. World coarse grain trade is expected to decline 11 percent in 1989/90 (October-September), largely reflecting better foreign crops and increased competition with wheat for feed. U.S coarse grain exports also are projected to drop sharply, but U.S. market share will decline only slightly.

Feed Grain Supply and Use

The National Agricultural Statistics Service (NASS) forecast feed grain production for 1990 at 227.4 million metric tons, up 3 percent from last year's 221.1 million tons. Corn production is forecast to increase 8.2 million tons (4.3 percent) because of increases in yield and area harvested.

Partly offsetting the larger corn crop are forecast decreases in sorghum and oat production of 1.8 and 0.1 million tons, respectively. Higher forecast yields for these crops are being more than offset by a smaller area harvested. Barley output is forecast at 8.8 million tons, the same as last year, as a higher average yield just offset a 600,000-acre decrease in area harvested.

Taking into account beginning stocks and imports, the marketing year supply of feed grains for 1990/91 is forecast at 274.4 million tons, down 14 million (5 percent) from 1989/90. Carryin stocks for 1990/91 are expected to total 46 million tons, compared with 65.9 million tons for 1989/90. The drop in forecast carryin stocks results from use exceeding 1989's production by 21 million tons. Feed grain imports are forecast at 1 million tons, 400,000 tons less than 1989/90, largely reflecting an expected drop in oat imports. Corn will comprise about 85 percent of the 1990/91 feed grain supply, almost 2 percentage points above last year.

Record Foreign Production Forecast

World coarse grain production in 1990/91 is forecast at 817 million metric tons, 18 million (2 percent) above the 1989/90 harvest. Foreign production is expected to reach 589.5 million tons, up 12 million (also 2 percent), with the USSR forecast up 8 million to 113 million tons.

World trade is expected to be down 11 percent to 90 million tons in 1990/91. Larger production of coarse grains in some major importing countries, and increased competition from wheat used as feed account for the decline in trade. Domestic use in foreign countries is forecast at nearly 650 million tons, down 2 million from the preceding year. However, even with increased prodcution and lower domestic use, foreign ending stocks are expected to drop almost a million tons in 1990/91.

1990/91 Use and Stocks Down

U.S. feed grain disappearance for 1990/91 is forecast at 235.9 million tons, almost 3 percent less than 1989/90. Feed and residual disappearance is forecast at 136.4 million tons and FSI use at 39.2 million, up 1 percent and 2 percent, respectively, from a year earlier. However, exports are expected to decline 12.5 percent to 60.3 million tons in 1990/91, more than offsetting the relatively small increases in domestic disappearance. Wheat and rye (June-May)feed and residual use are forecast at 11 million tons in 1990/91, 2.4 times the 1989/90 figure.

While forecast down from a year earlier, feed grain use in 1990/91 is expected to exceed production for the fourth consecutive year. Ending stocks are forecast at 38.5 million tons, down 16 percent from the forecast carryin of 46 million tons. This would be the lowest ending stocks since 1976/77. The ending stocks-to-use ratio would be 16.3, compared with 19.0 for 1989/90, and the lowest ratio since 1975/76's 13.1.

The tightening supply/use is expected to generate higher average farm prices in 1990/91. Feed grain prices, weighted by forecast disappearance, are forecast to range from $91 to $108 a ton, compared with $94 in 1989/90 and almost $102 in 1988/89. The price strength is expected to be limited primarily to corn and sorghum, with barley prices near the 1989/90 average farm price and oats averaging lower.

1989/90 Supply and Use

Forecast use in the United States for 1989/90 is 242.4 million tons, reflecting FSI use of 38.5 million tons and exports of 68.9 million, up almost 3 and 13 percent, respectively, from 1988/89. Feed and residual disappearance is forecast at 135.1 million tons, 13 percent higher. Feed and residual dis-

Table 1--Feed grains: Supply, disappearance, and ending stocks, June/May, 1980/81-1990/91

Year	Supply				Disappearence				Total
	Beginning stocks	Production	Imports	Total	Food & indus.	Feed & resid.	Export	Total	Ending stocks
	Million metric tons								
1980/81	107.2	197.9	0.2	305.3	23.1	128.2	73.3	224.6	80.7
1981/82	80.7	246.2	0.2	327.1	25.0	127.5	61.0	213.4	113.6
1982/83	113.6	250.2	0.2	364.1	27.2	137.2	53.3	217.7	146.4
1983/84	146.4	136.4	0.6	283.4	29.3	127.0	56.5	212.8	70.6
1984/85	70.6	236.8	0.7	308.1	31.7	129.3	57.9	218.9	89.2
1985/86	89.2	274.3	0.6	364.1	34.7	136.6	40.3	211.6	152.5
1986/87	152.5	251.6	0.8	405.0	35.4	138.0	40.3	213.7	191.3
1987/88	191.3	216.5	1.0	408.8	36.4	147.6	51.0	235.1	173.7
1988/89	173.7	149.3	1.2	324.2	37.5	120.9	59.0	217.5	106.8
1989/90	106.8	221.1	1.4	329.3	38.3	135.1	69.4	242.9	86.4
1990/91	86.4	227.4	1.3	315.0	NA	NA	NA	NA	NA

NA = Not available.

appearance of wheat and rye (June-May) in 1989/90, at 4.6 million tons, was about the same as a year earlier.

June-May Supply and Use

The above feed grain supply and use data are aggregates of barley and oats on a June-May marketing year, and corn and sorghum on a September-August year. Supply and disappearance on a June-May year places both availability and use on a common time period and reflects more accurate relationships, particularly between disappearance and price. The total feed grain supply for June-May 1989/90 was 329.3 million tons, nearly 2 percent larger than 1988/89. June 1 stocks of 106.8 million tons were down almost 39 percent, but production of 221.1 million tons was up 48 percent. Imports were up 200,000 tons to 1.4 million.

Disappearance for 1989/90 totaled 242.9 million tons, nearly 12 percent above 1988/89. FSI use was 38.3 million tons and exports 69.4 million, up 2 percent and nearly 18 percent, respectively. Feed and residual use amounted to 135.1 million tons, up nearly 12 pecent.

The large margin of use over production during 1989/90 left June 1, 1990, stocks of 86.4 million tons, 20.4 million less than a year earlier. These stocks, plus forecast production of 227.4 million tons, and an estimated 1.3 million tons of imports, rounds out the forecast supply for June-May 1990/91 at 315 million tons, 4.3 percent less than in 1989/90.

Corn

Use up in Third-Quarter 1989/90

The March-May 1989/90 corn supply (March 1 stocks plus a small quantity of imports) was 4.8 billion bushels, 400 million less than a year earlier. Use during March-May came to almost 2.0 billion bushels, 188 million more than a year earlier. FSI use of 351 million bushels was up 14 million and exports of nearly 601 million bushels were up about 9 million. The major increase was in feed and residual disappearance, up 165 million bushels to slighty over 1.0 billion.

Third-quarter use left June 1 stocks of about 2.84 billion bushels, compared with 3.42 billion on June 1, 1989. In 1989, about 1.36 billion of June 1 stocks were in the Commodity Credit Corporation (CCC) inventory and the Farmer-Owned Reserve (FOR), leaving 2.06 billion bushels available at then current prices. This year, about 692 million bushels were in CCC inventory and FOR stocks, again leaving about 2.15 billion bushels available to the market at current prices.

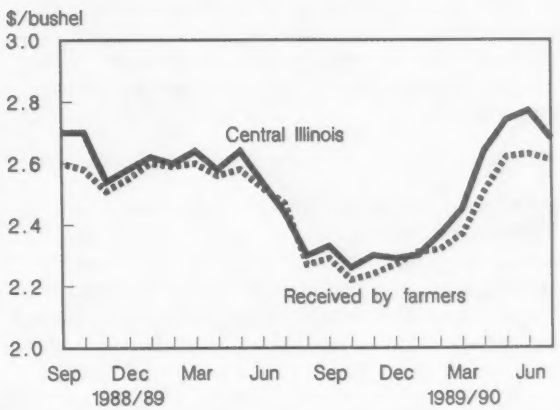
Disappearance during June-August likely will run a little over 1.5 billion bushels, slightly larger than a year earlier. FSI use is expected to be about 336 million bushels, and exports about 485 million, increases of 6 million and 22 million from a year earlier. However, feed and residual disappearance likely will only run about the same as last year's 696 million bushels, as wheat is expected to replace a significant amount of corn in cattle and poultry feeding, particularly in the Plains, Delta States, and Southeast. June-August use, forecast at 1.5 billion bushels, would leave about 1.33 billion in carryout stocks, about 600 million less than on August 31, 1989. This would be the lowest ending stocks since 1983/84.

The farm price of corn averaged $2.30 a bushel during December-February and increased 8.7 percent to $2.50 for March-May. The rise was almost double the normal seasonal increase of 4.8 percent and resulted from a tighter supply situation and a wet spring that delayed plantings in the eastern and southern portions of the Corn Belt. The farm

Table 2--Corn supply, disappearance, and stocks, March-May

Item	1988/89	1989/90
	Million bushels	
Supply:		
Stocks March 1	5,203.9	4,812.7
CCC	465.0	537.2
FOR	995.5	403.8
Loan	968.4	676.5
Free	2,775.0	3,195.2
Imports	1.2	0.6
Total Supply	5,205.1	4,813.3
Disappearance:		
Food, seed, & industrial	337.0	351.0
Exports	591.6	600.8
Feed and residual	857.2	1,022.1
Total	1,785.8	1,973.9
Stocks June 1:		
CCC	417.7	299.3
FOR	884.3	392.5
Loan	677.4	444.1
Free	1,439.9	1,703.5
Total	3,419.3	2,839.4

Figure 1
Monthly Average Corn Prices



price peaked in June at $2.63 a bushel and declined in the following weeks as the corn crop developed favorably. In the first half of August, the Central Illinois cash price averaged about $2.53 a bushel, compared with $2.77 in June.

1990 Crop Forecast at 7.85 Billion Bushels

On August 9, NASS released the first survey-based forecast for the 1990 corn crop. The crop was forecast at 7.85 billion bushels with a national yield of 117.7 bushels per acre from 66.7 million acres harvested. Planted area was down 100,000 acres, and area to be harvested for grain was off 400,000 acres, from indications in the June *Acreage* report. The weighted average yield for the 17 major producing States, which account for almost 95 percent of the crop, was 119.4 bushels per acre and the average yield for the remaining States was only 92.9 bushels per acre.

A year earlier, the first forecast of the 1989 crop was 112.8 with a 17-State weighted average yield of 113.7 bushels per acre, and 100 bushels per acre for the remaining States. In January 1990, the yield for 1989 was estimated at 116.2 bushels per acre, with the 17 States averaging 117.1 and the other States 102.4. If this year's crop improves as much as last year between August and harvest, this year's national yield likely would be a record.

The 1990 crop still lags in its development, however. For the week ending July 29, about the time the August crop survey was being taken, corn silking for the 17 major States was only 56 percent complete, compared with 71 percent in 1989 and a 5-year average of 82 percent. However, favorable weather during early August has enabled the crop to develop rapidly. For the week ending August 12, silking for the major 17 States was 92 percent complete, compared with 95 percent last year and an average of 97 percent.

The major threat to the size, and particularly the quality, of this year's corn crop is the possibility of an early frost. By August 19, only 49 percent of this year's crop was in the dough stage, compared with 66 percent last year and an average of 76 percent. Last year, 83 percent of the area in the 17 major States was still in the dough stage on August 27 and 20 percent still had not reached the dent stage by September 10. Thus, with this year's crop still lagging last year's crop, a significant area would be in jeopardy from an early September freeze.

Corn Supply, Use, and Ending Stocks Down for 1990/91

Even though this year's corn crop is forecast about 325 million bushels larger than last year's, a 600-million bushel decline in beginning stocks will lower the 1990/91 supply about 3 percent from 1989/90 to nearly 9.2 bllion bushels. Imports for 1990/91 are expected to be about the same as a year earlier.

Total corn use in 1990/91 is forecast at 7.98 billion bushels, 2 percent less than expected for 1989/90. FSI use is expected to rise about 20 million bushels, although, this probably will depend on how long the sitaution in the Middle East lasts. Gasoline prices have risen substantially with the loss of Iraq and Kuwaiti oil on the world market, enhancing the potential for blending ethanol with gasoline. The impact of the Clean Air Act is unknown because Congess has yet to work out a compromise between the House and Senate. Nevertheless, the Act is not expected to have an impact on the ethanol market until at least the 1991/92 marketing year.

Exports are forecast at 2,075 million bushels for 1990/91, 275 million less than expected this year. World grain production for 1990/91 is forecast up almost 66 million tons from 1989/90 (19 million in the USSR) and the forecast for world coarse grain trade is down 11.5 million tons from a year earlier.

Feed and residual disappearance is forecast to rise 100 million bushels to 4.6 billion in 1990/91. However, the year-to-year increase will depend on what happens to wheat exports and how long wheat prices continue depressed by slow market movement. On a pound-for-pound basis, wheat has been priced below corn and there have been reports of widespread substitiution of wheat for corn, particularly in cattle and poultry feeding. Wheat also is replacing sorghum in the Plains and Delta areas. Most of the wheat feeding generally occurs in the June-August quarter when wheat prices are at their harvest lows and corn and sorghum prices are at their seasonal peak. However, if wheat exports remain in the doldrums, wheat prices will likely continue to be competitive with corn beyond June-August.

Most livestock feeding activities are expected to expand in 1990/91. The number of grain consuming animal units (GCAU's) are forecast at 79.2 million for 1990/91, up 1.8 percent from 1989/90.

Forecast total use exceeds the expected size of the corn crop by 125 million bushels, indicating a decrease in carryout stocks to about 1.2 billion by August 31, 1991. The ending stocks-to-use ratio would be 15.1, compared with 16.4 forecast for 1989/90. With the tighter supply situation and smaller ending stocks in prospect for 1990/91, corn prices at the farm are expected to average higher than the forecast 1989/90 average of $2.38. In 1990/91, the average farm price is expected to range from $2.35 to $2.75.

Factors that would drive the price to or towards the upper end of the range are: 1) an early freeze, or other factors that would cut corn yields and the 1990 corn crop, 2) larger utilization than forecast, and 3) adverse weather next spring and early summer. Factors that would push the average farm price towards the low end of the range are: 1) a larger corn crop than currently forecast, 2) lower disappearance in

1990/91, especially exports, and 3) excellent planting and growing conditions next spring.

The corn price at Central Illinois elevators averaged $2.53 for the first half of August, compared with $2.26 a year earlier. Prices are expected to work seasonally lower this fall and, barring a surge in USSR imports such as last year, reach their harvest low in November.

Sorghum

Total Use Up

Sorghum use during September 1989-May 1990 totaled 725 million bushels, up nearly 7 percent from last year. Food and industrial use was down nearly 7 million bushels, caused by a sharp decline in sorghum and sorghum products used in making distilled spirits. Exports and feed and residual use were nearly 8 percent above last year.

Stocks on June 1 amounted to almost 333 million bushels, of which 203 million were tied up in CCC inventory and FOR loans. An additional 7.7 million bushels were under regular loans but available to the market at current prices. Use for June-August is forecast at 81 million bushels, which would leave ending stocks of 252 million. Free stocks on June 1 were sufficient to meet market needs for the last quarter. In addition, about a third of the crop had been harvested in Texas by July 28.

1990 Crop Estimated at 547 Million Bushels

Based on conditions around August 1, NASS forecast this year's sorghum crop at 546.8 million bushels harvested from 9.3 million acres. The August yield forecast was 59.1 bushels per acre, 3.7 bushels above last year. Sorghum producers harvested a 1989 crop of 617.9 million bushels from 11.2 million acres.

If September 1 stocks equal the current forecast of 252 million bushels, total supply for 1990/91 will be 799 million bushels, 24 percent below 1989/90. Use during 1990/91 is projected to be down 125 million bushels from 1989/90 with export dropping 60 million and the feed and residual use off 65 million. FSI use in 1990/91 is expected to remain the same as in 1989/90. Even with the reduced domestic and export use, 1990/91 use is expected to sharply exceed the 1990 crop, leaving stocks on August 31, 1991, less than half of the expected ending level for 1989/90. The forecast 119 million bushels would be the lowest ending stock level since the 117.3 million bushels in 1976/77.

The farm price of sorghum averaged $2.08 per bushel during September 1989-May 1990, well above the loan rate of $1.57 per bushel. Only 20.9 million bushels of the 1989 crop were placed under regular 9-month loans, this was 4.7 percent of the sorghum eligible for loan placement. Placement should be small again in 1990/91. The average farm price for 1990/91 is expected to range from $2.15 to $2.55 a bushel, well above the loan rate of $1.49. Thus, most of the new-crop sorghum placed under loan should be marketed during the year.

Barley

1989/90 Situation Eases

Barley use in 1989/90 totaled 453 million bushels, up 28 million from the previous year, but well below 1987/88. FSI use at 180 million bushels was steady. On the other hand, feed and residual use at 184 million in 1989/90 was up 18 million from 1988/89. Even with the enormous production gain (403 million bushels, compared with only 290 million in 1988/89), carryin stocks were down more than production was up. Thus, with smaller supplies and larger use, ending stocks were down 35 million bushels to only 161 million. The larger use and smaller stocks dropped the stocks-to-use ratio to 35.5 percent, one of the lowest in years.

The average farm price for the 1989/90 crop year was $2.42 per bushel, compared to $2.80 in 1988/89. This decline appears to be mainly the result of declining prices for malting barley during the year. The spread between malting barley prices at Minneapolis and feed barley prices at Duluth dropped from an average of $1.18 a bushel during June-August 1989 to $0.70 for March-May 1990, but feed barley prices were $0.13 a bushel higher in March-May than at the beginning of the marketing year. This decline follows the largest "spread" on record in 1988/89 — $1.80 a bushel.

Barley Yields Improve in 1990

Yields are forecast up across most of the Northern Plains as timely soaking rains covered the region at critical times during the growing season. Since subsoils are rated "extremely dry," according to the Palmer Index of Drought Severity, surface moisture has greatly benefitted the crop.

Barley production for 1990/91 is forecast at 403 million bushels, matching the 1989/90 crop, although from a smaller harvested area. Crop yields for 1990/91 continue to rebound from the 1988/89 drought, and are forecast to reach 52.0 bushels per acre, compared with 48.6 in 1989/90, and 38.0 bushels per acre in drought ravaged 1988/89. Forecast harvested area is 7.7 million acres in 1990/91, 94 percent of the area planted. In 1989/90, 90 percent of the planted area was harvested.

Even though the 1990/91 production is forecast to match last year, barley supplies will be down about 6 percent to 578 million bushels due to an 18-percent reduction in beginning inventories. This continues a 4-year decline in end-of-year barley stocks, from 336 million bushels in 1986/87.

Prospects for malting barley production in 1990/91 appear mixed. Although the total planted area is down, the share

planted to malting barley varieties appears to be up. North Dakota, Montana, and Idaho all report increases in the share of barley area occupied by malting varieties such as Robust (the most popular), Morex, Azure, and Busch 1602, and others of lesser importance.

Barley use in the 1990/91 marketing year is estimated at 445 million bushels, down modestly from the previous year, but 20 million above the 1988/89 drought-reduced level. FSI use and exports are projected to remain unchanged from last year. Feed and residual disappearance, however, is forecast to fall slightly. Use is still forecast above production, dropping ending stocks to 133 million bushels. Ending stocks would equal only 30 percent of total use, the lowest ratio since 1974/75. Barley prices for 1990/91 are forecast to range from $2.25 to $2.65 per bushel as corn prices support feed barley prices. The gap between malting barley and feed barley prices is down from last year. During June and July, the spread between malting barley prices at Minneapolis and feed barly prices at Duluth averaged $0.36 cents a bushel.

The barley Acreage Reduction Program (ARP) requirement for the 1990 crop was 10 percent. It is estimated that about 800,000 acres are being idled. An additional 1.9 million acres will be taken out of production and placed in the 0/92 program, and 2.7 million will be idled under the long-term CRP. Participation in the barley programs, forecast at over 69 percent, is up slightly from 1989/90.

Oats

Oats Supply Increases in 1989/90

Oat production in 1989/90 was 374 million bushels, up significantly from the drought-reduced level of 218 million in 1988/89. The 1989/90 crop year began with the lowest beginning stocks on record, only 98 million bushels. But larger imports (72 million bushels, compared to 63 million in 1988/89) and the rebound in production raised domestic supply 152 million bushels to 545 million.

The 1989/90 increase in oat harvested area (up from 5.5 million acres 1 year earlier to 6.9 million) was a response to unusually high oat prices in 1988/89 and greatly improved weather conditions. The yield was 54.4 bushels per acre, equal to the average of the 1980's but 15.1 bushels per acre above the drought-reduced yield of 1988.

The feed and residual and FSI uses in 1989/90 were up 92 million bushels to 386 million, but well below other years. Feed and residual disappearance has been trending downward since the late 1950's. FSI use rose slowly until the mid-1980's when gains accelerated as granola was introduced and more recently with the introduction of oat bran.

Production gains of 156 million bushels for the 1989/90 crop year more than offset increases in oat use and beginning stocks. As a result, end-of-year oat inventories increased to 157 million.

The weighted average farm price for 1989/90 was $1.49 per bushel, down 43 percent from a year earlier. The price of high-quality oats (measured as #2 heavy white oats in Minneapolis) fell from a high in June 1989 of $1.97 to around $1.60 for the following several months. The simple 12-month average was $1.65, down $1.15 from the previous year. However, this remains somewhat above that of earlier years.

The oats-to-corn price ratio, based on prices received by farmers, has fallen from an unusually high of 1.01 in 1988/89 (when oat prices soared in response to plummeting supplies) to 0.63 the following year. The decline in the ratio in 1989/90 reflects the 37-percent increase in supply over 1988/89. The supply in 1989/90 year, was more than adequate to cover needs of processing and horse feeding plus a surplus which had to compete with corn and other feeds for a market outlet.

In the 1989/90 crop year, participation in the oat farm program continued to fall. At 18 percent, participation was down sharply from the 30 percent in 1988/89. Once again, the ARP requirement was set at 5 percent. About 100,000 acres were idled under the ARP in 1989/90, along with 300,000 additional acres enrolled in the 0/92 program and 1.1 million in the long-term Conservation Reserve Program (CRP).

Rains Benefit 1990/91 Crop

Oat outturn in 1990/91 looks similar to 1989/90, but harvested area is forecast down, while yields are up. Production is expected to reach 365 million bushels, only marginally below 1989/90. Yields are forecast at 59 bushels per acre, up 4.6 bushels from the previous year. Yields are forecast up 12, 10, and 17 bushels per acre from last year in South Dakota, Minnesota, and North Dakota, respectively,—the largest producing States.

Larger June 1 inventories, along with relatively steady production, are expected to more than offset a forecast decline in imports, allowing a modest 23-million bushel increase in 1990/91 supplies.

Oat use is forecast to climb 13 percent in 1990/91 to 436 million bushels. All but 5 million bushels of the 49-million-bushel increase are in feed and residual use, as low oat prices promote greater feeding. With use increasing more than supplies in 1990/91, inventories are projected to fall over the year, from a beginning level of 157 million bushels to only 132 million by year's end. The stocks-to-use ratio is forecast to be 30 percent, down significantly from 41 percent in 1989/90. This is modestly improved from the late 1980's,

and is only slightly lower than the 33-percent average recorded over the decade of the 1980's.

Besides the supply, oat prices are also heavily dependent on the prices and availability of other feed grains, notably corn. Corn prices are forecast to be higher in 1990/91. Oat prices were high relative to corn early in the 1989/90 marketing year and declined during the year. With the oat supply forecast 4 percent larger this year than a year earlier, oat prices are expected to be near their long-term normal relationship to corn prices, which will likely result in lower farm prices this year. The weighted average farm price for 1990/91 is expected be between $1.10 and $1.50 per bushel.

The oat ARP requirement for 1990 again was 5 percent. However, with program participation only about 10 percent, the acres idled under this program will be minimal. Farm prices were expected to be far above the loan rate this spring, making participation in the oat program unattractive. About 157,000 acres were placed in the 0/92 program and an additional 1.3 million acres are expected to be in the CRP this year.

Hay

Hay Yields and Production Improve in 1990/91

Hay production in 1990/91 is forecast to reach 148.5 million tons, an increase of over 3 million tons above the improved outturn of the previous year. The harvested area is expected to fall below 62 million acres, down almost 1.7 million from last year, and well below 1988/89.

Forecast yields, at 2.40 tons per acre, more than offset expected area losses. Yields are 5 percent above last year and above the 1984/85-1989/90 average of 2.33 tons per acre. Growing conditions in the major hay-producing States have generally improved with the return of timely precipitation.

Yields are forecast to increase 28 percent in Wisconsin, the leading producer. California yields are expected to remain steady. Dry conditions in Texas, however, seriously cut prospective yields. Across the North Central States, yields are significantly improved, with gains in Minnesota (up 27 percent), North Dakota (up 11 percent), South Dakota (up 56 percent), and Nebraska (up 15 percent).

Alfalfa production, forecast at 82.2 million tons, is up almost 5 million from 1989/90 and 13 million above 1988/89. National yields of 3.30 tons per acre are 11 percent above the preceding year, and will more than offset about 1 million fewer acres expected to be harvested. Production of other hay for 1990/91 is forecast to fall about 2 million tons to 66.3 million. A decline in harvested area is primarily responsible, although yields are forecast to fall marginally.

Supplies Improve as Well

Increased hay production this year is further bolstered by relatively large carryover stocks as well. At 27.1 million tons, beginning stocks May 1 were 55 percent larger than in 1989/90, and equalled beginning stocks in 1988/89. Total supply is estimated at 175.5 million tons, up over 12 million from last year, but still about 4 million tons below the average for the 3 years beginning in 1985/86. A modest expansion in the number of roughage-consuming animal units (RCAUs) to 77.7 million this year (up from 76.3 million in 1989/90) indicates that hay disappearance will increase from 1989/90's 135.8 million tons. Supplies per RCAU, at 2.26 tons per unit, also show continued improvement. Production and disappearance depend heavily on range and pasture conditions through the rest of the season as well as other feed availabilities. However, if hay disappearance per RCAU marginally exceeds 1989/90's level of 1.78 tons per unit, carryout stocks will be around 35 million tons, and should provide a cushion for hay use the following year.

... But Prices are High

In 1989/90, hay prices fell in the first quarter of the May-June year, rose in the last quarter, and were generally steady in the second and third quarters. Prices peaked at $103 per ton in May 1989, continuing the pattern of higher prices that started the latter half of the preceding crop year. The marketing year price for all hay averaged $86 per ton, up less than $1 from the previous year and well above prices during the preceding 5-year period.

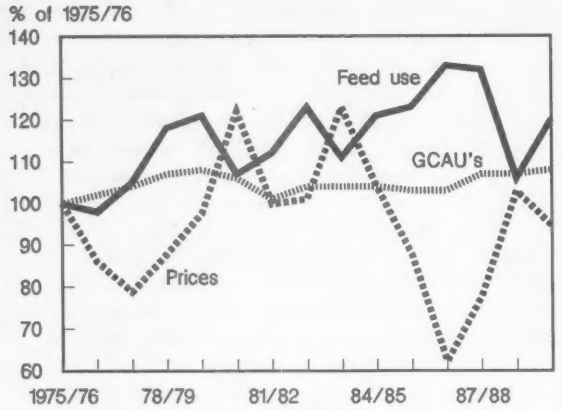
Alfalfa prices during 1989/90 averaged $94.58 a ton, the highest annual price on record and $1.85 higher than the previous year. Month-by-month prices of other hay were relatively high last year, but were generally lower than 1988/89 prices, which responded to limited supplies.

Alfalfa availability in key dairy producing States will continue to play a major role in setting prices in 1990/91. Among the top 5 milk-producing States (Wisconsin, California, New York, Minnesota, and Pennsylvania), alfalfa production is up 15 percent this year. Alfalfa prices in the current year likely peaked in the first month of the crop year, (May) at $110 per ton.

Feed Demand

Feed demand is expected to increase in the 1990/91 combined marketing year. Feed and residual use of coarse grains (corn, sorghum, barley, and oats) is expected to be 1 percent above the 135.1 million metric tons forecast for 1989/90. During late July and early August, wheat was favorably priced relative to corn. Thus, wheat is expected to replace a significant amount of corn in cattle and poultry feeding, particularly in the Plains, Delta States, and Southeast.

Figure 2
GCAU's, Prices, and Feed Use



The index of grain consuming animal units (GCAU's) in 1990/91 is forecast to be up nearly 2 percent from 1989/90, which was 1 percent above 1988/89. Even with an increase in GCAU's, feed and residual use of coarse grains and wheat is not expected to show as large a year-to-year gain as in 1989/90. Increased prices expected for the coarse grains would tend to limit the gain, and the year-to-year increase in 1989/90 was abnormally large given the marginal gains in GCAU's.

The number of dairy cows on farms during April-June 1990 was essentially the same as a year earlier but milk production per cow was up 2 percent. A year earlier, some dairy producers ran short of hay because the cool, wet spring delayed pasture growth and the first cutting of alfalfa, plus lowered hay quality in many areas. In 1990, some areas had a wet spring, but generally the hay was in better shape than a year earlier. Even so, dairy producers reported a 1-percent increase in grain and other concentrates fed on July 1, 1990, relative to 1989.

Strong prices for milk have offset recent price increases for grain and soybean meal, continuing the period of profitability. Milk production is expected to remain above a year earlier during the rest of 1990 and 1991. Dairy cow numbers are expected to remain about the same, but milk production per cow is likely to increase. In 1990/91, feed demand from the dairy sector is expected to remain strong.

Feed demand from the beef sector should remain strong for the remainder of 1990 and in 1991. Beef production is forecast down during the rest of 1990 but up in 1991. Fed beef production is expected to remain near to above year-earlier levels. Good forage supplies in most areas and high grain prices will likely result in cattle continuing to remain on pasture to heavier weights before being placed on feed. During periods of relatively strong beef prices and ample grain supplies, a high percentage of the cattle move through feedlots. As a result, nonfed steer and heifer slaughter is low. Producers continue to modestly expand the beef cow herd. Last January, replacement heifers 500 pounds and over were up 1 percent from a year earlier and on July 1, 1990, replacement heifers were up 4 percent. Beef cow slaughter is about as large as a year ago. The decline in total cow slaughter is mostly dairy.

As of June 1, 1990, U.S. hog producers reported intentions to farrow as many sows as last year during June-August and 2 percent more in September-November. These intentions, if realized, would be a sharp reversal from the 5-percent decline from a year earlier in December 1989-May 1990. Despite more pigs saved per litter during December 1989-May 1990, the pig crop was still 4 percent below last year. The expected increase in farrowings would strengthen feed demand by the pork sector in late 1990 and 1991.

Feed demand by the poultry sector is expected to continue strong in 1990/91. In 1990, broiler production is expected to be up nearly 7 percent from 1989. Favorable returns are expected to encourage additional production in 1991—projected to be 5 percent over 1990.

Turkey producers are expected to increase 1990 output nearly 9 percent from 1989. Favorable returns in the fourth quarter of 1989 plus expected declines in red meat production encouraged increased production this year. Returns were not favorable in first-quarter 1990 but have improved since then. Current projections for 1991 turkey production are for another 5 percent increase from 1990.

Egg producers have had favorable returns in 1989 and 1990 but have not sharply boosted production. In 1990, egg production is forecast to be 1 percent above 1989. With the increase in eggs used for hatching to boost broiler production, total consumption in 1990 is forecast to be about the same as 1989 but per capita egg consumption is down. A similar pattern is expected in 1991—production up 1 percent but per capita consumption down again.

Food, Seed, and Industrial Use of Corn

FSI use of corn in 1989/90 (September/August) is expected to total 1,280 million bushels, up nearly 3 percent from last year. Nearly all of the increase is in wet milled products; the largest increases are in high fructose corn syrup (HFCS) and alcohol.

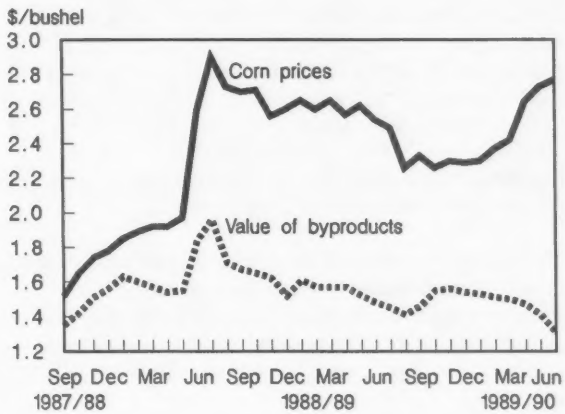
HFCS production in 1989/90 is forecast to use 380 million bushels of corn. Because nearly 70 percent of HFCS is used to sweeten soft drinks, hot weather, which stimulates soft drink sales, increases HFCS use. Weather this summer has been mixed, with some areas hot and others with normal or below temperatures. As a result, some HFCS producers are

reporting heavier-than-expected shipments and others indicating volumes falling short of projections. HFCS production during September 1989-May 1990, was 1 percent above a year earlier. Thus, a strong production run in the fourth quarter of the marketing year will be needed to meet the forecast.

Glucose and dextrose production in 1989/90 is forecast to increase 3 percent from 1988/89. During September 1989-May 1990, glucose and dextrose production was 5 percent ahead of a year earlier. In addition to increased domestic use, glucose and dextrose exports have been larger in 1990 than the same months in 1989.

Ethanol made from starch in the wet milling process is forecast to use 220 million bushels of corn in 1989/90, up from 210 million last year. Through March 1990 (the latest data available), ethanol used in domestic blending and exports used about 2 percent more corn than last year. Exports have helped maintain corn use because blend sales of gasoline and ethanol during September 1989-March 1990 were nearly 15 percent below a year ago. The net cost of corn to wet millers rose from 71 cents in October 1989 to $1.46 in June 1990, the seasonal high for 1989/90.

Figure 3
Wet Milling Corn Cost



While corn prices have been up seasonally, prices of byproducts have declined, principally gluten feed and gluten meal. Corn oil prices have generally strengthened since September, but not enough to offset the declines in gluten feed and meal. The rise in corn prices has probably had more of an effect on the profitability of dry milled alcohol production. The present crude oil crisis in the Middle East has sharply boosted gasoline prices and also ethanol prices.

Use of corn in the manufacture of starch in 1989/90 is expected to be up 1 percent from 1988/89. Starch production and use tends to be tied to the general economy, which is expanding slowly. There are signs that the economy is slowing and if so, this could mean the same or slightly less starch production in 1990/91.

In 1990/91, FSI use of corn is forecast to increase 3 percent from 1989/90. Most of the increase likely will be in the wet milling sector among the corn sweeteners and alcohol. Dry milling will likely use about the same amount. More alcohol is expected to be used in gasoline blends to increase supplies and to meet oxygenated fuel mandates.

Transportation Update

Overall Situation

Demand for Grain Transportation Down Seasonally

July exports of grains and soybeans, as measured by inspections for export, are down 41 percent from November's peak of 471 million bushels. Demand for transportation is slack,

Table 3--Corn: Food, seed, and industrial use 1/

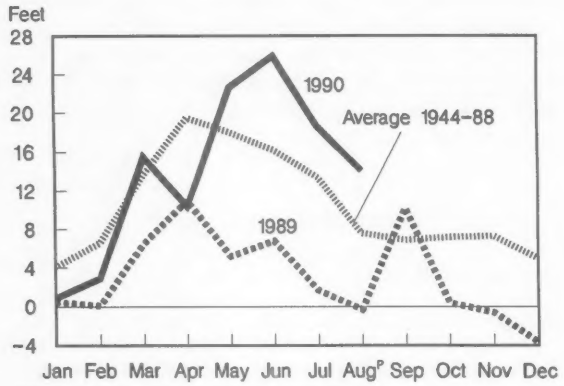
Year beginning September 1	HFCS	Wet-milled products: Glucose and dextrose	Wet-milled products: Starch	Wet-milled products: Alcohol	Dry-milled alcohol	Dry-milled and alkaline cooked products	Seed	Total
				Million bushels				
1975	45	162	116	5	20	154	20	522
1976	62	164	116	10	15	155	20	542
1977	80	170	124	10	20	158	20	582
1978	105	170	124	15	20	155	20	609
1979	127	170	120	25	20	158	20	640
1980	165	183	120	35	35	160	20	718
1981	185	183	130	83	35	162	19	797
1982	215	188	127	130	50	170	15	895
1983	256	189	147	150	50	164	19	975
1984	310	187	143	170	100	160	21	1,091
1985	328	188	152	185	127	161	19	1,160
1986	339	185	155	200	135	161	16	1,191
1987	359	187	167	200	136	163	17	1,229
1988	362	190	164	210	139	161	19	1,245
1989	380	195	165	220	140	161	19	1,280

1/ Data are estimates based on production and sales figures from Government and private industry.

with rail down and barge up from January. Total domestic consumption and exports of grains and soybeans are now estimated at 358.9 million metric tons for the combined 1989/90 crop year, up 7.2 percent from the prior year, but 3 percent below 1987/88.

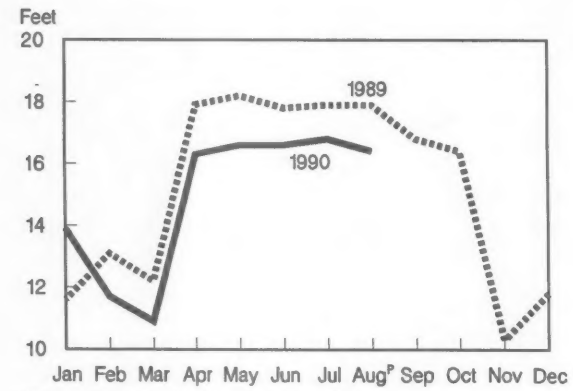
Generally adequate transportation services are expected to be available during the 1990/91 crop year. However, navigation conditions are likely to become difficult this fall on the Mississippi River between St. Louis and Memphis because of projected low water flows from the Missouri into the Mississippi. The U.S. Army Corps of Engineers has announced plans to close the Missouri for navigation on November 1, 1990. This promises to increase grain marketing costs for firms relying on the Missouri River, but will not markedly decrease the total distribution system's ability to respond to sudden increases in demand for grains and oilseeds.

Figure 4
River Stages at St. Louis



Water level at flood gauge August 1990 data preliminary.

Figure 5
River Stages at Sioux City



Measured at flood gauge August 1990 data preliminary.

Projected disappearance of grains and soybeans for 1990/91 is 358.2 million metric tons, very slightly below 1989/90. The pattern of disappearance, however, indicates changes in demand for grain transportation in 1990/91. Corn exports are projected at 52.71 million metric tons, down 12 percent from 1989/90. Because the Mississippi River system dominates inland movement of corn for export, the reduced export level suggests that demand for barge transportation will slacken significantly during 1990/91.

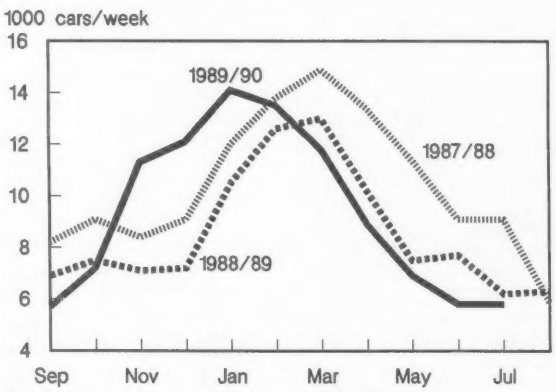
The projected 5-percent decline in wheat exports also points toward reduced demand for transportation. For wheat, however, reduced export demand is most likely to result in lowered demand for rail cars to deliver grain to ports. Increased domestic consumption of wheat now projected is not expected to offset the reduced demand for rail cars. The majority of this increase stems from increased feeding of hard red winter wheat to livestock in the Southern Plains. Much of this wheat likely will be fed close to points of production, and any shipments involved are most likely to be made by truck.

Rail Situation

Rail car loadings of grain and soybeans have trended down since January. In May 1990, average rail car loadings of grain and soybeans fell 21 percent from January's high to 25,775 cars per week, a quantity easily supplied. By July, loadings had slipped further to 25,600 cars per week, but 2 percent above July 1989. The squeeze on rail service from November 1989 through February 1990 has ended, and is not expected to return in the 1990/91 crop year.

Additionally, the supply of covered hopper cars will increase shortly. The Burlington Northern Railroad previously announced that it is adding 1,000 covered hopper cars to its fleet, and the Itel Rail Corporation has announced plans to

Figure 6
Rail: Average Grain Unloadings



At Atlantic, Gulf, and Pacific ports. July and August 1990 preliminary.

Figure 7
Rail Car Loadings of Grain and Soybeans

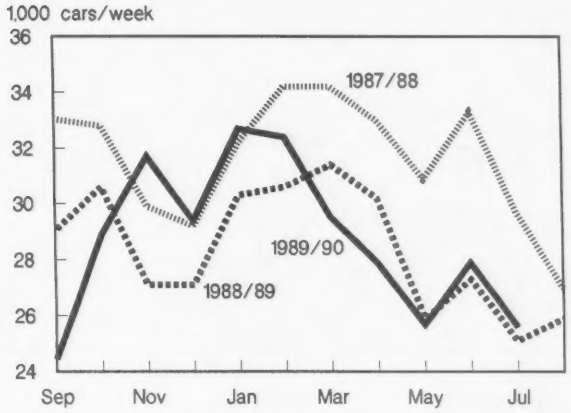
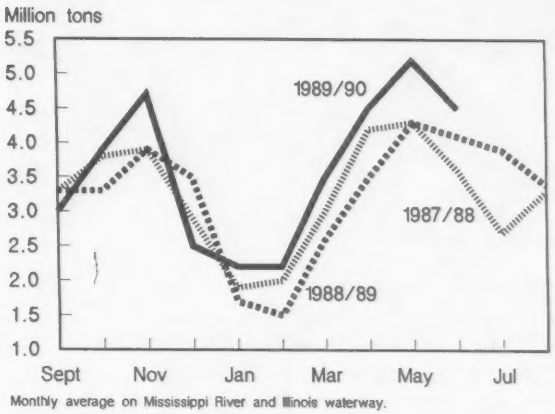


Figure 8
Average Grain Shipments



Monthly average on Mississippi River and Illinois waterway.

add 500 jumbo covered hopper cars with capacities of 4,750 cubic feet each. Some short-term scattered rail car shortfalls are expected, however, as the corn and soybean crops are harvested.

Rail deliveries of grain to export points rose steadily in the early months of 1989/90 and peaked in January at 14,100 cars per week. During December-March, these deliveries accounted for 40-43 percent of all railed grain. Deliveries began to decline in February, and by July had fallen 63 percent from January to 5,175 cars per week. During June and July, export shipments accounted for 21-22 percent of all railed grain. A year earlier, exports were 25-28 percent of the total shipments.

The largest decline took place at the Texas ports, where shipments fell 86 percent from January to 1,100 cars per week in July. Deliveries to Pacific Coast ports averaged 2,183 cars per week below January, a 40-percent drop. Shipments of grain to Pacific Coast ports require a relatively large number of car days, compared with shipments to North Atlantic ports. Thus, the decline in rail deliveries to the Pacific Coast causes a disproportionate decline in demand for rail service. Substantial decreases of 45 to 90 percent also took place at North Atlantic, South Atlantic, and Mississippi River ports. North Atlantic and Mississippi River ports averaged more than 2,000 cars per week below January.

Rail rates appear to have increased only slightly during 1989/90. In September 1989, the Bureau of Labor Statistics' (BLS) index of rail grain rates stood at 108.4 (Dec. 1984=100) and by July had risen 0.5 percent to 109. The July index shows an increase of only 0.5 percent over July 1989. In contrast, rates in 1988/89 averaged 6.3 percent above 1987/88.

The modest increases from 1988/89 reflect declining railroad operating costs, as adjusted for productivity increases, over the last 12 months. The Interstate Commerce Commission projected adjusted costs for the third quarter of 1990 to be 1.0 percent below the second quarter. Recent reported increases in diesel fuel prices suggest that operating costs for all transport modes are likely to rise in coming months. At this time, it is not possible to estimate either the degree of increase or how long it will persist.

The last sharp upturn in fuel prices occurred in June 1979, when the BLS index for grain was 60.6. In July, the index rose to 61.4. Because railroads often hold significant inventories of diesel fuel and obtain fuel under long-term contracts, their fuel costs are partly insulated from short-lived fluctuations in fuel prices. Fuel accounts for about 7 percent of total rail costs, and any prolonged increase in diesel prices must be reflected in the rates charged.

At the same time, competition among modes and carriers often limits a carrier's ability to pass along cost increases. Minimum bid prices quoted by the Burlington Northern Railroad for corn shipped in single cars under the Certificate of Transportation Program did not increase between August 2 and August 16, 1990. Cars can now be ordered for January 1991 delivery to shippers. The first such minimum bid was $791 per single car, nearly 5 percent below the bid for December 1990. Subsequent minimum bids for both single cars and unit trains have been at the previously quoted bids for December delivery.

Barge Situation

Since February, low water has ceased to hinder navigation on the Mississippi River. Through August, the water's depth at St. Louis (as measured at the flood gauge) averaged 13.6 feet, up 200 percent from a year earlier and 4 percent above

Figure 9
Rail Rate Index for Grain

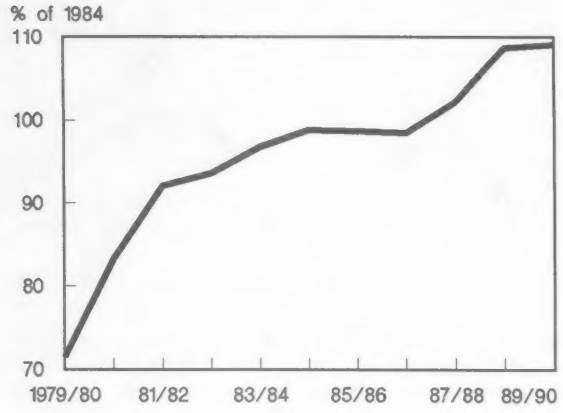
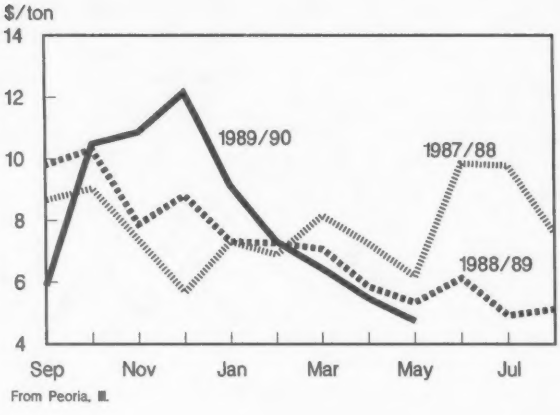


Figure 10
Barge Rates to New Orleans



From Peoria, IL.

the 1944-88 average. Near-normal navigation conditions are expected for September and October. In June, the river stages at St. Louis averaged 25.9 feet, 59 percent above the 1944-88 average and 280 percent above June 1989. July showed a substantial lowering to 18.6 feet and preliminary data for August indicate a further drop to 14.1 feet. In contrast, the long-term average for August is 7.6 feet, and August 1989 averaged minus 0.3 feet.

Water levels are expected to fall for the remainder of the year. In 1988, 60 to 89 percent of the total water flow at St. Louis came from the Missouri River. As the Corps of Engineers closes the river to navigation by reducing the amount of water released from reservoirs on the Missouri's headwaters, the river's flow will be sharply curtailed.

Last year, the river's level at Sioux City fell 4.5 feet immediately after the navigation season closed at the end of October, and dropped another 2.5 feet during the first week of November. This year, a similar fall is expected. Navigation conditions on the Missouri in November and December promise to be more restrictive than last year. The reduced water flow also will impact the Mississippi River, but current water levels on it suggest that extreme low water will not be encountered before the Upper Mississippi freezes.

Towboat captains are experienced with low-water conditions, and the new Melvin Price lock and dam complex has greatly reduced the number and length of backups that characterized the past two seasons. Through July, grain shipments through the southern-most lock on the river averaged 5 percent above 1988/89. Should there be sudden increases in export demand, the barge industry appears able to meet them.

Grain and soybean shipments on the river system in May achieved a 10-year record for the month, 5.2 million tons, 136 percent above January. Volume declined in June to 4.5 million tons, but nearly 10 percent above June 1989. July showed an 11-percent increase to 5 million tons, 28 percent greater than July 1989. Despite low water during the winter, the Mississippi and Illinois Rivers carried an average 3.7 million tons of grain each month during the first 10 months of 1989/90, 12 percent above the prior year.

Barge rates have trended down since December. In June, rates to New Orleans from Peoria, IL averaged $5.47 per ton, 55 percent below December 1989. Rates from St. Louis during the same period fell 54 percent to $3.99 per ton. Data for July show further declines. Rates from Peoria averaged $4.56 per ton, down 17 percent from June, and those from St. Louis were down 19 percent.

Fuel costs comprise about 25 percent of a towboat's operating costs. If fuel costs rise in coming months, barge operators will attempt to raise rates. Low rates since May, despite relatively large volumes moved, suggest that competitive pressures will hinder attempts to obtain higher rates. Early in August, rates rose somewhat, but at mid-month remained below June levels.

World Coarse Grain Outlook

World coarse grain production is projected to rise 2 percent in 1990/91 to 817 million tons, the highest in 4 years. World consumption is projected to be virtually unchanged at nearly 826 million tons, but still well above production. This will result in a stock drawdown for the fourth consecutive year. However, this anticipated reduction of about 8 million tons will be much smaller than in the previous 3 years.

The continued tightening of coarse grain supplies in 1990/91 is expected to be more than offset by more abundant supplies

of wheat. Global wheat stocks are projected to increase 18 million tons, allowing some rebuilding of total world grain stocks. Little change is expected in rice stocks.

World coarse grain trade is expected to decline sharply in 1990/91, largely reflecting better crops in key importing countries and increased competition with wheat for feeding. Trade is projected to decline 11 percent from 1989/90.[1] U.S.coarse grain exports are also projected to drop fairly sharply, but the U.S. market share will decline only slightly.

Record Foreign Production Expected in 1990/91

Foreign coarse grain production is projected to rise 2 percent to a record 590 million tons. This is 9 million tons above the previous high of 1988/89. Significant production gains are forecast for a number of critical importing countries, including the Soviet Union, Mexico, and Turkey, which will lead to lower import needs.

The biggest year-to-year increase will occur in the Soviet Union, where coarse grain output is projected to rise 8 million tons despite a decline in area (see below). In China, coarse grain production is expected to grow nearly 2 million tons, led by gains in corn. This reflects slight increases in both area and yields. Forecast production of corn and total coarse grains in China will exceed the previous records in 1987/88.

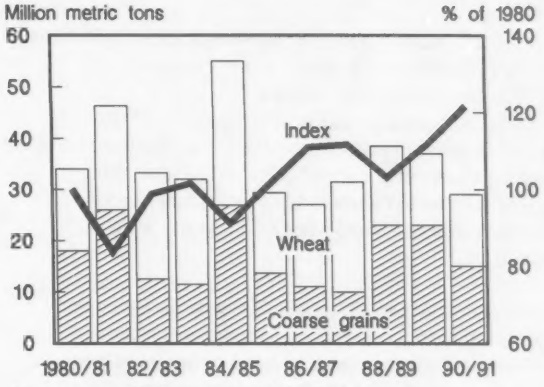
Turkey's coarse grain crop is projected to increase about 1.1 million tons, marking a partial recovery from last year's drought. In Mexico, production is likely to rise 900,000 tons, due entirely to corn as sorghum output slips marginally. Mexican farmers responded to higher producer prices announced well in advance of the crop by planting more corn, and weather conditions for the rainfed crop have been the most favorable since 1987.

For the major competing exporters, the outlook is mixed, with aggregate production projected to fall slightly. Prospects for Canada's crop are good, with production projected to rise 1.5 million tons. Most of the increase will take place in barley as improved yields more than outweigh a small drop in area. Argentina's coarse grain output is projected up 1.4 million tons, assuming improved weather, but planting has not yet started.

EC production is projected to fall 3.5 million tons because of declines in corn and barley. While growing conditions for the EC's wheat crop, mainly winter-grown, were generally favorable in northern areas, widespread dryness in recent months has reduced the potential for coarse grains, which are mostly spring planted. In France, the EC's largest corn producer, many farmers switched from corn to sunflowers,

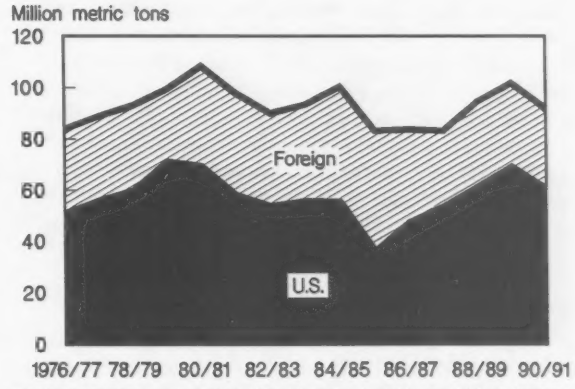
[1] All trade years referred to in this section are October-September and exclude intra-EC trade unless otherwise specified.

Figure 11
Soviet Union: Grain Imports and Index of Production



July-June year. 1990/91 forecast. Excludes rice imports.

Figure 12
U.S. and Foreign Coarse Grain Exports



October/September year. Excludes intra-EC trade. 1989/90 and 1990/91 forecast.

which are more tolerant of dry conditions. With only a temporary reprieve in early summer, the lack of moisture in France has likely reduced yield prospects for corn.

Projected changes are smaller for other competitors. Little change is expected in Thailand's production, with corn forecast up 100,000 tons. Australia's production is expected to decline about 400,000 tons because of more average barley yields after last year's record. In South Africa, corn output is projected down 500,000 tons, similarly because of lower expected yields, but planting has not yet begun.

Bumper Soviet Grain Crop Reduces Import Prospects

Production of total grains in the Soviet Union in 1990/91 is forecast at 230 million tons, second only to the record 1978/79 harvest. Yields are expected to average record high for both coarse grains and wheat. Very favorable weather

conditions account for this development, and, in contrast to most other years, no extensive areas of weather-related yield problems were reported.

Soviet coarse grain imports are projected at 15.9 million tons in 1990/91 (October-September), down 7 million from 1989/90. Despite the third largest wheat crop on record, Soviet wheat imports are expected to equal 1989/90's 14 million tons, because of attractive prices and the likelihood of importing some wheat for feed. This would represent a rough balance between wheat and coarse grain imports, unlike the previous 2 years when coarse grains were more predominant.

There is generally a rough association between Soviet grain output and imports (figure 11), but the volatile pattern of Soviet imports also is influenced by other factors. These include the proportion of dockage and waste that reduces usable grain, the gap between the harvest and the amount of grain sold to the State, and the availability of foreign exchange for imports.

There has apparently been little or no progress in reducing grain losses during harvest and marketing, as evidenced by current reports of fuel shortages and other problems. With a bigger crop, there is a possibility of reversing the recent declining trend in State grain procurement, but this is far from assured, given the uncertain progress of reforms. However, given likely limitations of onfarm storage space, there probably will be greater deliveries from this year's bumper crop. In recent months, there also have been questions about the Soviet Union's import ability and reports of requests for credit from suppliers. However, if sustained, the current jump in the prices of gold and petroleum—major Soviet exports—will improve Soviet buying capacity.

World Coarse Grain Trade To Contract

Foreign consumption of coarse grains is projected to decline 2 million tons in 1990/91, the first decline since 1985/86. Combined with larger foreign production, this will contribute to a sharp reduction in imports from the buoyant level of 1989/90. World trade is projected at 90 million tons, down from the 101.5 million forecast for 1989/90, the second highest on record (figure 12). World wheat trade in 1990/91, in contrast, is projected to grow slightly from the previous year, assuming countries such as the USSR and South Korea import some wheat for feeding.

Besides the sharp drop in Soviet imports, significantly lower imports also are projected for Eastern Europe, Turkey, Mexico, and Taiwan. Japan's imports are forecast to slip a bit, continuing the flat trend of the last few years. Only a slight increase in imports by South Korea—a major growth market in recent years—is likely in 1990/91 because of more purchases of wheat for feed.

Although Eastern Europe's production is expected down in 1990/91, imports are projected to fall more than a third. Consumption is stagnating in some countries, while dropping in others. This reflects higher meat and grain prices after removal of price controls and subsidies in many countries, growing unemployment, and falling real income. The region's numerous economic problems and import ability are being further aggravated by higher costs for imported energy. East Europe is facing world market prices as its main supplier, the Soviet Union, has cut oil deliveries and plans to end concessional energy pricing arrangements with the region soon.

East Germany's coarse grain use and imports will decline in 1990/91 because of its reunification with West Germany and adoption of the EC's Common Agricultural Policy. This process will involve considerable restructuring of East German agriculture, including a cut in milk and meat production, adjustment in feed rations, and a realignment of imports to more EC sourcing, with the imposition of an import levy on grain from outside the EC. Given the cutback in consumption and an expected large crop, there is a possibility that East Germany will place grain into EC intervention stocks and even export some grain onto the world market.

U.S. Corn and Sorghum Exports To Drop, Barley Unchanged

The decline in Soviet corn imports is the primary reason for lower projected world corn trade and lower U.S. corn sales in 1990/91. The Soviet Union was the world's leading corn buyer and largest U.S. market in the previous 2 years. World trade in corn is forecast down 11 percent. U.S. corn exports to all destinations are forecast to fall 12 percent (about 7 million tons), while competitor corn exports are forecast down 6 percent (800,000 tons).

World trade in sorghum is expected to fall 12 percent in 1990/91 because of tighter supplies relative to corn. U.S. exports are projected to decline 20 percent (1.2 million tons), and competitor sorghum shipments are forecast to remain about unchanged from the low 1989/90 level.

World barley trade is expected to slip 4 percent (700,000 tons) in 1990/91, mainly because of lower exportable supplies in Australia. U.S. and EC exports are forecast unchanged, while Canada's decline 8 percent. In the 1989/90 year, now drawing to a close, Canada's, Australia's, and U.S. barley exports increased and EC exports declined. Canada's 1989/90 exports are forecast to be the highest in 3 years.

Sharp competition will continue in barley markets in upcoming months. EEP sales will remain important for U.S. exports, although some old EEP offers that have not been completed (to Hungary, Romania, Switzerland, Tunisia, and Turkey) will expire at the end of September. Two new U.S.

Table 4--World coarse grain trade: Major exporters and importers by commodity, 1986/87-1990/91 1/

Item	1986/87	1987/88	1988/89	1989/90 2/	1990/91 3/
	Million metric tons				
CORN					
Exporters:					
U.S.	39.4	44.5	51.3	60.0	52.8
Argentina	4.0	3.7	2.5	2.5	3.5
China	3.8	4.1	3.7	2.5	2.5
Thailand	2.6	0.7	1.4	1.3	1.0
South Africa	2.6	0.6	2.0	3.5	1.5
Others	4.1	3.1	2.8	3.2	3.6
Total	56.4	56.7	63.8	73.0	64.9
Importers:					
Japan	16.1	16.7	15.9	16.3	16.5
USSR	7.6	7.9	17.9	17.9	12.5
EC-12	2.9	3.7	2.4	2.7	2.5
Korea, Rep.	4.6	5.0	5.7	6.8	7.0
Taiwan	3.5	4.2	4.2	5.3	4.6
Mexico	3.4	3.2	3.2	4.7	4.0
China	1.6	0.2	0.0	0.5	0.2
East Europe	1.7	2.2	2.4	3.4	1.6
Brazil	1.4	0.0	0.2	0.3	0.9
Egypt	2.4	1.4	1.2	1.2	1.4
Others	11.2	12.2	10.7	13.8	13.7
Total	56.4	56.7	63.8	73.0	64.9
SORGHUM					
Exporters:					
U.S.	5.1	6.1	8.1	7.2	6.0
Argentina	1.0	1.2	0.7	1.1	1.0
Australia	0.6	0.6	0.3	0.2	0.3
Others	1.1	0.5	1.7	0.5	0.5
Total	7.8	8.3	10.8	9.0	7.9
Importers:					
Japan	4.2	3.9	4.1	3.9	3.4
Mexico	0.8	0.9	2.3	2.6	2.0
Taiwan	0.8	0.3	0.1	0.2	0.2
Venezuela	0.8	1.7	1.0	0.1	0.2
Israel	0.2	0.4	0.4	0.4	0.4
USSR	0.1	0.0	1.2	0.3	0.4
Others	0.9	1.1	1.7	1.5	1.3
Total	7.8	8.3	10.8	9.0	7.9
BARLEY					
Exporters:					
EC-12	6.2	7.0	9.0	8.0	8.0
Canada	6.0	3.5	3.4	4.3	4.0
Australia	2.2	1.6	1.4	1.8	1.2
U.S.	3.0	2.9	1.7	2.0	2.0
Others	1.2	1.1	1.4	0.5	0.8
Total	18.6	16.1	16.9	16.7	16.0
Importers:					
Saudi Arabia	9.0	4.8	4.6	3.6	4.0
USSR	3.0	2.3	3.2	4.2	2.5
East Europe	1.3	1.6	2.2	1.9	1.7
Japan	1.2	1.3	1.3	1.2	1.2
Others	4.1	6.1	5.6	5.8	6.7
Total	18.6	16.1	16.9	16.7	16.0
COARSE GRAINS TOTAL TRADE	83.7	83.2	94.5	101.5	90.1

1/ October-September year, excludes intra-EC trade. Totals may not add because of rounding. 2/ Preliminary. 3/ Forecast.

initiatives, to Saudi Arabia for 750,000 tons and Israel for 200,000 tons, were announced in late July.

The EC countered immediately with an unusually large export license award of 600,000 tons at its next weekly open market tender, compared with an average award of about 67,000 tons in the previous 4 weeks. So far in August, however, EC weekly awards have also been considerably smaller than the 600,000 tons. Although EC barley production is forecast down about 3 percent, its export availability will remain large due to declining domestic consumption. EC barley use in 1990/91 is forecast to be the lowest since 1974/75.

Total U.S. coarse grain exports are projected at 60.8 million tons in 1990/91, down from 69.2 million in 1989/90. This expected decline reflects a shrinking import market more than any loss in U.S. competitiveness. The U.S. share of the world coarse grain market is projected at 67.5 percent in 1990/91, compared with a forecast 68.2 percent in 1989/90.

Foreign Coarse Grains: Prospects And Issues for the 1990's

Myles J. Mielke and Peter A. Riley*

Abstract: Foreign imports of coarse grains are projected to increase during the 1990's after declining through much of the 1980's. This import growth reflects greater absolute gains in foreign consumption than in production. Consumption is projected to increase at a faster rate than in the 1980's, but still less than the pace of the 1970's. Developing countries are expected to account for most consumption and import growth, assuming improved economic growth and reduced debt burdens. Many issues and uncertainties in the outlook are also identified and discussed.

Keywords: Coarse grains, projections, production, consumption, feed, imports, exports.

This article reviews foreign coarse grain trade prospects during the next decade. It also discusses the issues and uncertainties that could affect future coarse grain trade. These will focus mainly on country-specific issues.

Coarse grain trade prospects are based on the results of a long-term projection analysis undertaken in 1989 by the Economic Research Service (ERS). The exercise generated a scenario for foreign coarse grain production, consumption, and trade through 2000. Country and regional projections were generated by ERS economists using a combination of country models and judgmental analysis.

Assumptions and Methodology

Key underlying assumptions used in the projections included: 1) real world-market corn prices (used as a proxy for all coarse grains) decline in real terms over the projection period, however, corn prices strengthen relative to soybean prices; 2) the world economy expands more rapidly during the 1990's than it did in the 1980's, and there is some gradual debt relief for developing countries; 3) petroleum prices moderately increase in real terms; and 4) the current U.S. agricultural policy and international trade environment is continued through the 1990's. Thus, the outcome of the current GATT negotiations, the political and economic changes in Eastern Europe and the Soviet Union, and the Middle East crisis with its potential impact on economic growth could significantly change the scenario from the one presented here.

Projection results are presented for the period 1990-2000. The results are discussed in terms of growth rates estimated over the ten-year projection period. Projections for the 1990's are compared with growth rates for the previous two decades, placing the direction and magnitude of future tendencies in perspective.

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Long-term Projection Results

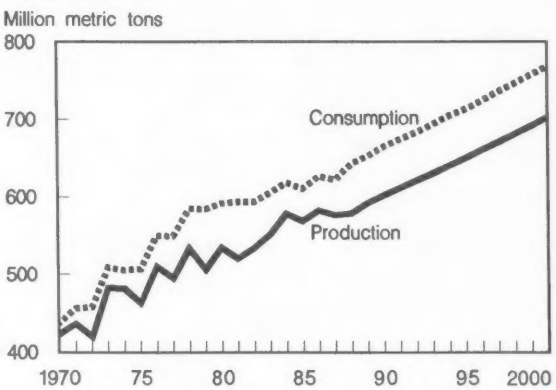
Foreign import demand for coarse grains is projected to continue its recent growth during the 1990's after declining through most of the 1980's. This is primarily the result of a combination of larger absolute gains in coarse grain consumption over production and higher carryover stocks.

Production

Annual growth in foreign coarse grain production during the 1990's is estimated at 1.6 percent (table A-1). This is about one-third higher than growth during the past decade, but still one-third slower than during the 1970's.

Virtually all of the production increase is expected to result from yield growth, which rises an average 1.4 percent per year. By contrast, area is projected to grow only 0.2 percent a year, below 1970's rate but above the 1980's negative growth. The higher yield versus area growth is similar to the pattern of the past two decades.

Figure A-1
Foreign Coarse Grain Production and Consumption



1970-89 actual, 1990-2000 projected.

Consumption

Coarse grain consumption is projected to increase by 1.5 percent annually, which is higher than the growth of the 1980's, but less than the dynamic growth of the 1970's (table A-1). Growth in feed use accounts for 80 percent of the total gain in coarse grain consumption.

Continued strong economic performance in the newly industrialized Countries (NIC's) of Asia and resumed economic growth in the other developing countries are the primary factors underlying future coarse grain consumption growth.

Coarse grain consumption in foreign developed countries is projected to continue to decline, largely because of developments in the EC. This downtrend is related to substitution of other feedstuffs, more efficient feeding rates, and changes in the mix of livestock and poultry produced. In many countries, poultry meat has recently been gaining as beef consumption flattens or drops. Because poultry are more efficient converters of feed, less grain per animal is needed for the same amount of meat produced. Dairy herds have also been shrinking because of gains in efficiency and slower increases, or even declines, in consumption of dairy products.

In the developing and centrally planned countries, especially China, more rapid growth in poultry production is also expected. However, this development does not necessarily imply any less grain feeding for other livestock, given the large potential for higher meat consumption in most of these countries.

Foreign population growth during the 1990's (1.6 percent) is expected to outpace consumption (1.5 percent), which continues the downward trend in per capita consumption. However, the decline in per capita consumption slows during the 1990's (table A-1).

Table A-1--Foreign Coarse Grain Growth Rates, Historical and Projected 1/

Variable	1970's	1980's	1990's
	Percent		
Area	0.8	-0.6	0.2
Yield	1.6	1.8	1.4
Production	2.4	1.2	1.6
Consumption	3.4	1.1	1.5
Feed Use	4.1	2.2	1.8
Imports 2/	9.2	-0.7	1.8
Exports 2/	2.5	-0.8	3.5
Population	1.9	1.8	1.7

1/ Compound growth rates calculated from semi-logarithmic trend functions.
2/ Excludes intra-EC trade.

Imports

Positive growth in foreign coarse grain imports during the 1990's is projected, compared with an average negative growth in the 1980's (table A-1). Imports are projected to grow by 1.8 percent annually during the 1990's. [1] However, this growth is still slow compared with the 1970's, when imports grew five times faster (table A-1).

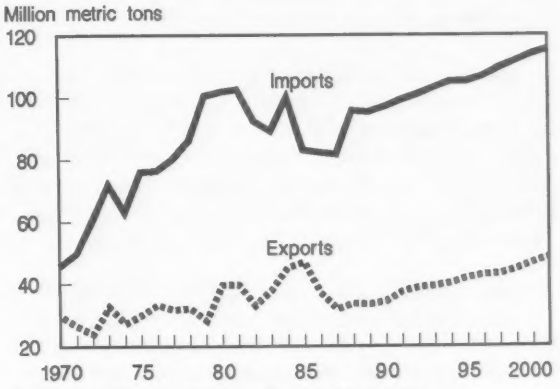
Principal coarse grain markets that are projected to expand from 1-3 million tons over the decade include Mexico, South Korea, Saudi Arabia, Japan, Taiwan, China, and Turkey. Together, these countries are estimated to account for almost 80 percent of the total increase in foreign import demand.

Economic recovery from the sluggish 1980's in Mexico, relatively high population growth rates in the developing countries, and, in some cases, slower production growth are the primary reasons for the recovery in coarse grain imports. Implied from the projections of economic recovery is strong growth in demand for livestock products and, subsequently, coarse grain feeds.

Although Japan is projected to be the largest coarse grain market by 2000, Japanese imports will not grow as fast as most other major importers. The average annual growth rate of Japanese coarse grain imports is reduced from 2 percent during the 1980's to under 1 percent in the 1990's. In addition to slower population growth, Japan's demand for coarse grains is likely to be affected by slower growth in its livestock industry as imports substitute for domestic meats.

[1] Coarse grain trade projections exclude trade internal to the EC (known as intra-EC trade).

Figure A-2
Foreign Coarse Grain Trade



Excludes intra-EC trade. 1970-89 actual, 1990-2000 projected.

The Soviet Union, which has alternated with Japan as the largest coarse grain market in recent years, is expected to reduce imports during the 1990's. Domestic consumption in the Soviet Union is projected to grow more slowly than production, continuing the pattern of the 1980's. The Soviets are likely to continue to import wheat for feeding. The amount to be imported will depend on price and availability on the international market. Reform of the Soviet economy is expected to improve production potential and marketing efficiencies while raising producer feed prices and consumer meat prices. The final outcome of *perestroika*, however, will largely determine the USSR's agricultural trade situation.

Exports

Foreign coarse grain exports are estimated to increase by 3.5 percent annually during 1990-2000, compared with little growth during the 1970's and a decline during the 1980's (table A-1). Most of the increase is expected to be generated by EC exportable surpluses (mostly barley). More moderate increases are estimated for Canada (barley) and Argentina (corn, sorghum). Two other major coarse grain exporters, Australia (barley, sorghum) and South Africa (corn), are not expected to have significant changes during the 1990's. Together, these exporters are expected to account for 80 percent of total foreign coarse grain exports by 2000, compared with 60 percent in 1990. Exports by Thailand and China are expected to decline over the decade.

Continued increases in EC farm surpluses resulting from the Common Agricultural Policy (CAP) are expected to further expand in EC coarse grain exports. EC production will continue to expand largely because of yield advances. Exportable supplies of coarse grains also will be increased by reduced domestic demand for feed. Coarse grain demand is expected to continue to be dampened, primarily by high prices related to the CAP and by the substitution of other feed sources, including wheat. Improvements in livestock feeding efficiencies are also likely to reduce feed demand. This outcome would change dramatically in the event of a GATT agreement which reduces EC subsidies.

Because of strong export growth and, to a lesser extent, reduced Asian exports, this analysis suggests that, without a GATT agreement, the EC share of foreign coarse grain exports will increase substantially over the next decade. EC agricultural policies are expected to support the expansion of coarse grain exports, unless the current round of the GATT negotiations reduces producer and export subsidies.

Two other primary exporters of coarse grains, Canada and Argentina, are projected to reverse their downward trends of the 1980's by showing relatively strong export growth in the 1990's. Together, their share of foreign coarse grain exports is estimated to increase over the decade. A recovery of coarse grain production and stagnant feed demand contribute to their positive export growth.

In the case of Canada, recovery of production growth following the drought-plagued 1980's and slower growth in domestic demand are expected to leave larger quantities of feed grains for export. The principal limitation on Argentine coarse grain exports during the past decade has been the competition for land from oilseed production. However, under the assumption of strengthening corn prices relative to soybean prices, the downward trend in Argentine coarse grain area is expected to be reversed. Export taxes and an overvalued exchange rate are assumed to continue to limit Argentina's export potential, and keep Argentina's exports well below the high levels of the late 1970's and early 1980's.

Relatively strong economic growth is expected to contribute to a reversal of Asian coarse grain export growth. For China, this would mean further gains in livestock production and, consequently, increases in feed demand. The demand for feed grains would be large enough to increase per capita coarse grain consumption during the 1990's, contrary to the overall foreign trend. Likewise, rising feed use in Thailand is expected to cut into exportable surpluses of corn. However, unlike China, much of the increase in Thailand's feed demand is linked to increasing meat exports. Together, China's and Thailand's share of foreign coarse grain exports is estimated to decline.

Issues and Uncertainties

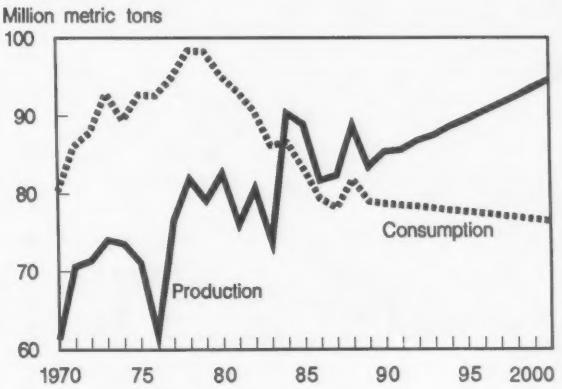
There are many sources of uncertainty in the future outlook that could change the results of these coarse grain projections. Most of the potential variability revolves around the scope and pace of policy reforms and questions about income growth. Changes in the price assumptions would also alter many of the projection results. This discussion highlights some of the more striking issues expected to dominate the outlook for the next decade.

The EC: Can Exports Continue To Rise?

Agricultural policies in the EC have had a tremendous impact on the coarse grain market in recent years. As recently as the late 1970's, the EC ranked as the world's largest coarse grain importer and a relatively small exporter. By the late 1980's, it had emerged as the world's second largest exporter and its imports had shrunken about 90 percent.

This transition stemmed from EC policies that discouraged imports, depressed coarse grain consumption, and encouraged greater use of nongrain feeds. There were also sharp increases in feeding and industrial use of wheat at the expense of coarse grain use. At the same time, coarse grain production kept rising so that exportable surpluses of coarse grains increased. In many cases, EC subsidies, known as

Figure A-3
EC-12 Coarse Grain Production and Consumption



1970-89 actual, 1990-2000 projected.

export restitutions or refunds, were provided to bridge the gap between higher EC prices and lower prices in export markets.

Although coarse grain area has been falling in the EC, this has been more than offset by yield increases and production has remained high. During the 1990's, EC yields are expected to increase at a rate just under 2 percent, slightly below the trend of the 1980's, resulting in continued production gains. This slower growth in yields assumes some reduction in the use of agricultural chemicals and fertilizer due to heightened environmental concerns. If yields were to grow at an ever faster rate due to the introduction of new technology, production would rise significantly. An additional annual yield increase of 0.5 percent, for example, would result in an increase in output of almost 5 million tons by 2000.

Area is projected to continue falling, despite an assumed decline in competing oilseed area, largely because returns to wheat are expected to stay above barley. Small acreage reductions could come from the set-aside program now in place and in response to a continued decline in real prices within the EC.

Estimates of future EC consumption are uncertain. Coarse grain consumption is expected to continue its decline, primarily due to reduced feed use, but at a more moderate pace. This will mean continued growth in EC exports, supported by the system of export refunds. This analysis assumes that intervention stocks will not grow significantly.

Simply extrapolating the sharper downward trend in EC consumption of the last decade through the 1990's would imply enormous coarse grain surpluses and even more dramatic export growth than projected. However, this scenario would result in significant problems in disposing of the surplus. Because most of the EC surplus would consist of barley, it is questionable whether it could displace corn in a number of export markets. A much larger volume of exports also implies skyrocketing subsidy costs that would increase internal pressure to feed more coarse grains.

Japan: Could Import Demand Shrink?

Japan has consistently been one of the world's largest coarse grain importers. However, after very steady increases in the last two decades, import growth has recently showed signs of leveling off. Japan has started to increase imports of beef under enlarged quota arrangements. This marks the beginning of meat market liberalization and will affect domestic feeding of coarse grains.

The rate of increase in Japan's coarse grain imports is projected to fall during the 1990's. However, it is possible that imports will stagnate at current levels, or even decline. This analysis assumes that broilers will account for most of the increase in coarse grain feeding over the decade, but this growth will be slower than in the past. Only small gains in feed use for hogs are expected and no growth for beef cattle. Japan's production of broilers and pork are both vulnerable to greater competition from imports than assumed here, however. Nonfeed use, mostly for starch and sweeteners, currently accounts for about 18 percent of total use and is projected to increase.

The amount of change in Japan's imports will largely depend on policy interactions and the degree of acceptance of imported meat. Per capita meat consumption is relatively low in Japan but is expected to increase. Total increases in meat consumption will also be influenced by a slower population growth rate. Imports are expected to capture most of the increase in meat demand. Some shifts in consumption are also expected if beef becomes cheaper, because it will begin to substitute for pork.

One reason that imported meat is cheaper in Japan is the high cost of feed grains. There is limited competition in the feed industry and extensive bureaucratic controls, including numerous barriers that keep feed grain prices high. Liberalization of these practices could make Japan's meat industry more competitive with imports.

The Soviet Union: Will Reforms Work?

Imports of coarse grains by the Soviet Union are projected to fall slightly over the next decade. It is assumed that reforms will gradually lead to increases in domestic grain output and reductions in losses and waste. Coarse grain consumption will continue to rise, but at a slower pace than previously because of increased protein feeding. Imports will provide a smaller share of total coarse grain use as domestic production grows.

It is clear that the Soviet reform process will require a long period of time. Weak distribution and marketing systems, for example, stem from poor infrastructure as well as management problems. If it is more difficult to raise domestic production than assumed in the projections, the Soviets will be more dependent on imports. On the other hand, continued political and economic problems and foreign exchange shortages could jeopardize the Soviet's ability to pay for imports, and result in lower imports than projected.

Eastern Europe: The Extent of Change?

The difficulty in forecasting policy adjustments is most dramatically illustrated by Eastern Europe. The incredible turn of events there occurred after ERS's projections were completed. The region was projected to increase its net coarse grain imports, with imports rising more than exports. However, the reduction or elimination of consumer subsidies now underway in most countries in the region are leading to higher prices and reduced consumption, implying less import demand and larger exportable supplies.

Improved incentives to farmers resulting from economic reforms could mean higher grain production, also contributing to lower imports and higher exports. The speed and success of reform will vary from country to country. Eastern Europe's widespread emphasis on exporting meat and livestock products is also subject to change. Hungary may cut meat exports, which relied on subsidies, and try to export more coarse grains.

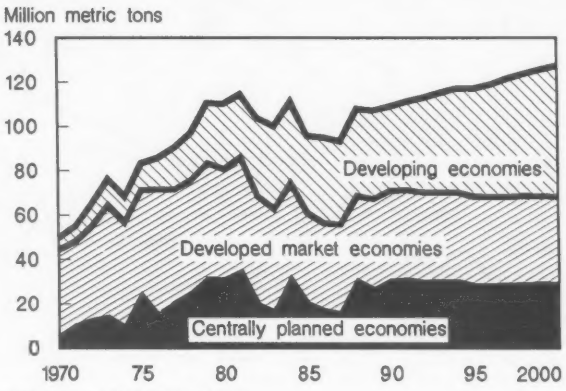
German unification and East Germany's integration into the EC were not assumed in this exercise, nor was the integration of other East European countries with the EC in this decade. These events could change the results of the projections.

The Developing Countries: How Much Economic Growth?

The slowing of developing country imports during the 1980's can be traced to slower economic growth, debt servicing, and foreign exchange constraints. In the 1990's, coarse grain imports by developing countries are projected to increase at a faster rate, becoming the main source of world demand growth. This assumes faster income growth and some progress in resolving debt problems by the mid-1990's, thus improving the demand for meat and livestock products and the ability to pay for imported grains.

Even at the projected level of coarse grain imports, per capita use is expected to continue to decline, reflecting relatively high population growth rates. If economic growth fails to reach forecast levels, imports could fall below projections and reduce per capita coarse grain use even more. This would suggest that per capita meat consumption, already low, could slip further.

Figure A-4
Foreign Coarse Grain Imports by Economic Group



1970–89 actual, 1990–2000 projected.

China: How Soon a Net Importer?

China is currently a large net exporter of coarse grains. Its exports are projected to gradually decline and its imports to increase so that it becomes a net importer by the late 1990's. This development stems from increased feed use to supply more meat, but domestic coarse grain production is not expected to be able to meet the increased demand. Although coarse grain area is expected to continue its decline, production will continue to rise because of yield increases.

However, the pace of this transition will be very uncertain. Like the developing countries, the rate of income growth will influence the demand for meat and China's import capacity. Per capita meat consumption is now low, indicating substantial potential to grow. Despite reforms, policies are still subject to a high degree of central control, and these will be critical in shaping future production, consumption, and trade patterns.

Cross-Commodity Issues

Modern feed industries are increasingly able and willing to use a wide variety of feedstuffs in their formulations, striving for least-cost combinations. In recent years, wheat has often replaced coarse grains in feed rations when relative prices and availabilities were favorable. The Soviet Union, South Korea, and Eastern Europe have been the major importers of wheat for feeding. Nongrain feeds such as cassava and industrial byproducts also have successfully substituted for coarse grains in many cases, when used with protein supplements such as soybean meal.

Real prices of coarse grains are assumed to decline in the first half of the 1990's and then turn up slightly in the second half. However, the price, relative to wheat and soybeans, is projected to strengthen. Thus, increases in foreign feed use

of wheat are likely, but the rate of growth is expected to be slightly below that of the 1980's. Declining oilseed prices, relative to coarse grains, will also support continued growth of alternative feeds that require protein supplements. If price trends differ, projected use of coarse grains could change.

Summary and Implications for U.S. Exports

This exercise identifies a number of uncertainties in the outlook for world coarse grain trade. Most relate to consumption issues. There is a substantial likelihood of a pickup in foreign import demand, but growth will not equal the robust pace of the 1970's. Primary growth markets are expected to be the developing countries. Economic recovery, falling real world coarse grain prices, and relatively high demand elasticities of demand for livestock products are behind the growth in import demand.

Assuming no changes in international trade policies, the 1990's portend sharper competition from the EC. Because net exports by other foreign suppliers, in aggregate, are expected to show little change, the EC is expected to capture a larger share of the foreign coarse grain market. The results of this analysis would imply a decline in U.S. coarse grain market share, given the assumptions presented at the beginning of this article. However, a GATT agreement that reduces EC subsidies would mean smaller EC exports and a falling EC market share.

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Appendix table 1--Feed grains: Marketing year supply and disappearance, a

Year 2/	Supply				
	Beginning stocks	Production	Imports	Total	Food, alcohol, and industrial
1984/85	39.6	236.8	0.7	277.1	31.4
1985/86	57.5	274.3	0.8	332.5	33.5
1986/87	126.4	251.6	0.7	378.7	34.2
1987/88	152.1	216.5	1.0	369.6	35.6
1988/89	133.6	149.3	1.2	284.2	36.3
1989/90 4/	65.9	221.1	1.4	288.4	37.3
1990/91 5/	46.0	227.4	1.0	274.4	---39.2

	Area		
	Set-aside and diverted	Planted	Harveste for grain
	Million hectares		
1984/85	2.1	49.5	43.2
1985/86	2.9	51.8	45.2
1986/87	7.3	48.5	41.1
1987/88	12.5	43.1	35.2
1988/89	11.1	41.2	32.6
1989/90	6.8	43.0	36.9
1990/91	6.2	42.1	36.6

1/ Aggregated data on corn, sorghum, barley, and oats. 2/ The marketing barley, June 1. 3/ Includes total Government loans (original and reseal) 7/ Deficiency payments. 8/ Deficiency and diversion payments.

nce, area, and prices, 1984/85-1990/91 1/

Disappearance						Ending stocks		
Domestic use								
od, and rial	Seed	Feed and residual	Total	Exports	Total disappearance	Govt. owned	Privately owned 3/	Total
	Million metric tons							
4	1.5	130.6	163.5	56.1	219.6	8.9	48.6	57.5
5	1.5	135.1	170.0	36.1	206.2	20.4	106.0	126.4
2	1.4	145.1	180.7	45.9	226.6	48.7	103.4	152.1
6	1.3	147.0	183.9	52.1	236.0	34.1	99.5	133.6
3	1.2	119.6	157.1	61.1	218.3	19.5	46.4	65.9
3	1.2	135.1	173.6	68.9	242.4	10.0	36.0	46.0
--39.2---		136.4	175.6	60.3	235.9			38.5

rvested for grain	Yield per harvested hectare	Index Average price received by farmers 6/	Government-support program Total payments to participants
---	Metric tons	1977=100	$ million
63.2	5.48	130	7/ 1,860
65.2	6.07	110	7/ 2,785
61.1	6.12	74	8/ 7,343
35.2	6.15	96	8/ 8,461
32.6	4.58	126	8/ 3,157
36.9	5.99	119	7/ 3,959
36.6	6.32	125	

keting year for corn and sorghum begins September 1; for oats and seal). 4/ Preliminary. 5/ Projected. 6/ Excludes support payments.

Appendix table 2--Foreign coarse grains: Supply and disappearance, 1980/81-1990/91 1/

Year	Beginning stocks	Production	Feed	Total Disappearance	Imports	Adjusted imports 2/	Ending stocks
			Million metric tons				
Corn:							
1980/81	45.8	240.1	168.4	297.6	79.1	78.1	48.9
1981/82	48.9	235.1	175.9	291.0	77.6	67.3	43.8
1982/83	43.8	230.3	174.3	281.2	73.2	63.3	39.1
1983/84	39.1	241.4	167.7	288.5	64.9	61.1	39.8
1984/85	39.8	263.9	183.6	303.3	72.5	66.6	47.4
1985/86	47.4	253.9	185.7	291.0	62.1	54.3	41.2
1986/87	41.2	265.3	193.2	307.2	61.1	56.4	37.2
1987/88	37.2	267.9	196.3	310.8	62.8	56.6	37.8
1988/89	37.8	275.1	212.8	326.5	73.1	63.8	37.9
1989/90 3/	37.9	269.0	215.8	329.5	78.4	72.9	37.2
1990/91 4/	37.2	270.9	210.9	325.2	71.0	64.9	35.5
Sorghum:							
1980/81	6.9	44.6	23.3	50.8	12.8	14.1	8.1
1981/82	8.1	48.1	28.5	55.5	14.3	13.7	7.4
1982/83	7.4	44.0	25.2	50.5	12.3	11.6	6.1
1983/84	6.1	46.5	25.7	52.3	13.1	13.0	6.5
1984/85	6.5	44.0	26.1	52.1	12.9	13.1	6.0
1985/86	6.0	42.0	24.9	47.6	9.6	8.5	5.0
1986/87	5.0	40.6	23.3	46.4	8.1	7.8	4.2
1987/88	4.2	37.7	22.7	44.8	8.7	8.3	3.1
1988/89	3.1	40.8	24.5	47.5	11.0	10.8	4.3
1989/90 3/	4.3	40.1	22.7	48.2	8.6	9.0	3.4
1990/91 4/	3.4	40.7	22.0	46.8	7.7	7.9	3.1
Barley:							
1980/81	16.9	155.4	107.5	156.7	16.3	13.8	17.1
1981/82	17.1	144.9	105.4	149.6	20.4	13.9	14.4
1982/83	14.4	155.6	107.8	152.9	17.2	13.1	17.9
1983/84	17.9	153.6	115.4	160.4	20.3	16.4	12.9
1984/85	12.9	162.5	115.8	157.7	23.1	17.9	19.1
1985/86	19.1	165.1	120.2	161.9	22.1	18.2	22.6
1986/87	22.6	169.2	125.6	167.8	24.0	18.4	26.7
1987/88	26.7	169.2	126.9	173.1	20.7	15.8	25.2
1988/89	25.2	161.0	118.5	162.9	20.5	16.7	24.8
1989/90 3/	24.8	160.0	121.0	166.5	20.4	16.4	19.8
1990/91 4/	19.8	167.3	122.4	167.8	18.3	15.7	20.8
Total coarse grains: 5/							
1980/81	77.4	534.0	342.0	599.9	110.3	108.1	81.5
1981/82	81.5	520.3	351.7	588.3	114.5	97.5	72.8
1982/83	72.8	533.6	356.9	585.5	104.0	89.5	73.2
1983/84	73.2	550.9	364.5	608.8	100.2	92.8	70.8
1984/85	70.8	578.0	377.3	618.4	111.1	99.6	85.9
1985/86	85.9	568.3	386.8	608.3	95.7	82.3	81.2
1986/87	81.2	579.7	394.8	624.7	95.1	82.9	81.4
1987/88	81.4	576.4	398.0	630.0	94.1	82.1	78.9
1988/89	78.9	580.6	404.3	640.2	106.2	93.0	79.4
1989/90 3/	79.4	577.5	413.3	651.7	109.6	100.2	72.7
1990/91 4/	72.7	589.5	409.6	649.7	99.0	89.0	71.8

1/ Aggregated on basis of local marketing years, except for adjusted imports. 2/ Based on Oct./Sept. trade year and excludes intra-EC trade. 3/ Forecast. 4/ Projected. 5/ Includes oats, rye, millet, and mixed grains.

Source: Compiled from World Grain Situation and Outlook, Foreign Agricultural Service, and USDA data.

Appendix table 3--Corn: Marketing year supply and disappearance, area,

Year beginning September 1	Supply				Food, alcohol, a industrial
	Begin-ning stocks	Produc-tion	Impors	Total	
1984/85	1,006.3	7,672.1	1.7	8,680.1	1,070.0
1985/86	1,648.2	8,875.5	9.9	10,533.6	1,140.0
1986/87	4,039.5	8,225.8	1.7	12,267.0	1,175.0
1987/88	4,881.7	7,131.3	3.4	12,016.4	1,212.0
1988/89	4,259.1	4,928.7	2.8	9,190.6	1,226.4
1989/90 2/	1,930.4	7,527.2	2.1	9,459.7	1,261.0
1990/91 3/	1,329.7	7,850.2	2.0	9,181.9	---1,30

	Area			Yield per harvested acre	Re far
	Set-aside and diverted	Planted	Harvested for grain		
	----------Million acres----------			Bushels	
1984/85	3.9	80.5	71.9	106.7	
1985/86	5.4	83.4	75.2	118.0	
1986/87	14.3	76.6	68.9	119.4	
1987/88	23.1	66.2	59.5	119.8	
1988/89	20.5	67.7	58.3	84.6	
1989/90	10.8	72.3	64.8	116.2	
1990/91	9.8	74.5	66.7	117.7	2.3

1/ Includes quantity under loan and farmer-owned reserve. 2/ Prelim
6/ Deficiency and diversion payments. 7/ Deficiency, diversion, and d

area, and prices, 1984/85-1990/91

Disappearance						Ending stocks Aug. 31		
Domestic use								
Food, ol, and strial	Seed	Feed and residual	Total	Exports	Total disap-pearance	Govt. owned	Privately owned 1/	Total
Million bushels								
0.0	21.2	4,090.5	5,181.7	1,850.2	7,031.9	224.9	1,423.3	1,648.2
0.0	19.5	4,107.3	5,266.8	1,227.3	6,494.1	545.7	3,493.8	4,039.5
5.0	16.7	4,701.2	5,892.9	1,492.4	7,385.3	1,443.2	3,438.5	4,881.7
2.0	17.2	4,811.7	6,040.9	1,716.4	7,757.3	835.0	3,424.1	4,259.1
6.4	18.7	3,986.7	5,231.8	2,028.4	7,260.2	362.5	1,567.9	1,930.4
1.0	19.0	4,500.0	5,780.0	2,350.0	8,130.0	225.0	1,104.7	1,329.7
-1,300.0----		4,600.0	5,900.0	2,075.0	7,975.0			1,206.9

Average prices				Government-support program		
Received by farmers 4/	St. Louis No. 2 yellow	Omaha No. 2 yellow	Gulf Ports No. 2 yellow	National average loan rate	Target price	Total payments to participants
$/bu.						$ million
2.63	2.81	2.65	3.00	2.55	3.03	5/ 1,654
2.23	2.37	2.25	2.52	2.55	3.03	5/ 2,479
1.50	1.68	1.53	1.83	1.92	3.03	6/ 6,327
1.94	2.19	1.98	2.39	1.82	3.03	6/ 7,388
2.54	2.72	2.49	2.93	1.77	2.93	7/ 3,687
2.38	8/ 2.57	8/ 2.38	8/ 2.84	1.65	2.84	7/ 3,629
2.35-2.75				1.57	2.75	

eliminary. 3/ Projected. 4/ Excludes support payments. 5/ Deficiency payments
nd disaster payments. 8/ September 1989-June 1990 average.

Appendix table 4--Sorghum: Marketing year supply and disappearance, are

Year beginning September 1	Supply				Food, alcohol, an industrial
	Begin-ning stocks	Produc-tion	Imports	Total	
1984/85	287.4	866.2	0.1	1,153.7	15.3
1985/86	300.2	1,120.3	---	1,420.5	26.0
1986/87	551.0	938.9	---	1,489.9	10.4
1987/88	743.3	730.8	---	1,474.1	23.5
1988/89	662.7	576.7	---	1,239.4	20.5
1989/90 2/	439.5	617.9	0.1	1,057.5	13.6
1990/91 3/	252.2	546.8	---	799.0	---15

	Area			Yield per harvested acre	Re farm
	Set-aside and diverted	Planted	Harvested for grain		
	Million acres			Bushels	
1984/85	0.6	17.3	15.4	56.4	4
1985/86	0.9	18.3	16.8	66.8	3
1986/87	2.7	15.3	13.9	67.7	2
1987/88	4.4	11.8	10.5	69.4	3
1988/89	3.9	10.3	9.0	63.8	4
1989/90	3.3	12.6	11.2	55.4	3
1990/91	2.9	10.7	9.3	59.1	3.8

--- = Not applicable.
1/ Includes quantity under loan and farmer-owned reserve. 2/ Prelimi
6/ Deficiency and diversion payments. 7/ Deficiency, diversion and dis

, area, and prices, 1984/85-1990/91

Disappearance						Ending stocks Aug. 31		
Domestic use								
ood, l, and trial	Seed	Feed and residual	Total	Exports	Total disap-pearance	Govt. owned	Privately owned 1/	Total
Million bushels								
.3	2.0	539.3	556.6	296.9	853.5	112.1	188.1	300.2
.0	1.7	663.8	691.5	178.0	869.5	207.2	343.8	551.0
.4	1.6	536.3	548.3	198.3	746.6	409.0	334.3	743.3
.5	1.3	555.3	580.1	231.3	811.4	463.6	199.1	662.7
.5	1.5	468.0	490.0	309.9	799.9	340.9	98.6	439.5
.6	1.1	505.4	520.1	285.2	805.3	150.0	102.2	252.2
---15.0---		440.0	455.0	225.0	680.0			119.0

Average prices				Government-support program		
Received by farmers 4/	Kansas City No. 2 yellow	Texas No. 2 yellow	Gulf Ports No. 2 yellow	National average loan rate	Target price	Total payments to participants
$/cwt.						$ million
4.15	4.46	5.04	4.90	4.32	5.14	5/ 158
3.45	3.72	4.33	4.07	4.32	5.14	5/ 227
2.45	2.73	3.24	3.22	3.25	5.14	6/ 570
3.04	3.40	3.81	3.96	3.11	5.14	6/ 709
4.05	4.17	4.66	4.81	3.00	4.96	7/ 349
3.79	8/ 4.10	8/ 4.36	8/ 4.75			7/ 430
3.84-4.55						

eliminary. 3/ Projected. 4/ Excludes support payments. 5/ Deficiency payments.
l disaster payments. 8/ September 1989-June 1990 average.

Appendix table 5--Barley: Marketing year supply and disappearance, area

Year beginning June 1	Supply				Food, alcohol, ar industrial
	Begin-ning stocks	Produc-tion	Imports	Total	
1984/85	189.4	598.0	7.4	794.8	149.0
1985/86	247.4	590.2	6.2	843.8	147.2
1986/87	327.2	608.5	6.6	942.3	156.1
1987/88	336.3	521.5	11.3	869.1	158.3
1988/89	321.1	290	10.5	621.6	164.7
1989/90 2/	196.4	403.4	14.2	614.0	165.4
1990/91 3/	161.0	402.5	15.0	578.5	---185

	Area			Yield per harvested acre	Re
	Set-aside and diverted	Planted	Harvested for grain		far
	Million acres			Bushels	
1984/85	0.5	12.0	11.2	53.4	
1985/86	0.7	13.2	11.6	51.0	
1986/87	2.0	13.1	12.0	50.8	
1987/88	2.9	11.0	10.0	52.4	
1988/89	2.8	9.8	7.6	38.0	
1989/90	2.3	9.2	8.3	48.6	
1990/91	2.4	8.3	7.7	52.0	2.2

1/ Includes quantity under loan and farmer-owned reserve. 2/ Prelimi
March 1987, shifted to Duluth. 6/ Deficiency payments. 7/ Deficiency

area, and prices, 1984/85-1990/91

Disappearance						Ending stocks May 31		
Domestic use								
Food, al, and strial	Seed	Feed and residual	Total	Exports	Total disap-pearance	Govt. owned	Privately owned 1/	Total
Million bushels								
9.0	21.4	305.4	475.8	71.6	547.4	15.6	231.8	247.4
7.2	21.3	328.4	496.9	19.7	516.6	57.4	269.8	327.2
6.1	17.9	298.4	472.4	133.6	606.0	75.5	260.8	336.3
8.3	15.7	253.1	427.1	120.9	548.0	50.1	271.0	321.1
5.7	15.0	166.2	345.9	79.3	425.2	30.4	166.0	196.4
6.4	14.4	184.2	364.0	89.0	453.0	19.0	142.0	161.0
---185.5---		175.0	360.5	85.0	445.5			133.0

Average prices				Government-support program		
	Minneapolis		Portland			
Received by farmers 4/	No. 2 or better feed 5/	No. 3 or better malting	No. 2	National average loan rate	Target price	Total payments to participants
$/bu.						$ million
2.29	2.09	2.55	2.59	2.08	2.60	6/ 50
1.98	1.53	2.24	2.23	2.08	2.60	6/ 159
1.61	1.44	1.89	1.97	1.56	2.60	7/ 351
1.81	1.78	2.04	2.09	1.49	2.60	7/ 337
2.80	2.31	4.11	2.74	1.44	2.51	8/ 164
2.42	2.21	3.20	2.64	1.34	2.43	8/ 70
2.25-2.65				1.28	2.36	

eliminary. 3/ Projected. 4/ Excludes support payments. 5/ Starting
ency and diversion payments. 8/ Deficiency, diversion and disaster payments.

Appendix table 6--Oats: Marketing year supply and disappearance, area, a

Year beginning June 1	Supply					
	Beginning stocks	Production	Imports	Total	Food, alcohol, and industrial	
1984/85	180.9	473.7	33.6	688.2	41.0	
1985/86	179.9	518.5	27.2	725.6	44.0	
1986/87	183.7	385.0	32.4	601.1	45.0	
1987/88	132.7	373.7	45.7	552.2	49.8	
1988/89	112.0	217.6	62.9	392.5	72.7	
1989/90 2/	98.3	373.8	72.4	544.5	91.3	
1990/91 3/	157.4	365.3	45.0	567.7	---120.	

	Area			Yield per harvested acre	Rece b farme
	Set-aside and diverted	Planted	Harvested for grain		
	Million acres			Bushels	
1984/85	0.1	12.4	8.2	58.0	1.
1985/86	0.1	13.3	8.2	63.7	1.
1986/87	0.5	14.7	6.9	56.3	1.
1987/88	0.8	17.9	6.9	54.3	1.
1988/89	0.3	13.9	5.5	39.3	2.
1989/90	0.4	12.1	6.9	54.4	1.
1990/91	0.2	10.4	6.2	59.0	1.10-

NA = Not available.
1/ Includes quantity under loan and farmer-owned reserve. 2/ Prelimina
6/ Deficiency and diversion payments. 7/ Deficiency, diversion and disas

ea, and prices, 1984/85-1990/91

Disappearance						Ending stocks May 31		
Domestic use								
od, , and rial	Seed	Feed and residual	Total	Exports	Total disap-pearance	Govt. owned	Privately owned 1/	Total
	Million bushels							
0	31.2	435.7	507.9	0.5	508.4	1.4	178.5	179.9
0	32.5	464.2	540.7	1.2	541.9	1.9	181.8	183.7
0	38.0	384.4	467.4	0.9	468.3	3.5	129.2	132.7
8	31.6	358.2	439.6	0.5	440.2	3.5	108.5	112.0
7	27.1	193.8	293.6	0.6	294.2	2.0	96.3	98.3
3	23.7	271.3	386.3	0.8	387.1	0.7	156.7	157.4
-120.0---		315.0	435.0	0.8	435.8			131.9

Average prices				Government-support program		
Received by farmers 4/	Minneapolis No. 2 white, heavy	Portland No. 2 white, heavy	Toledo No. 2	National average loan rate	Target price	Total payments to participants
$/bu.						$ million
1.67	1.81	2.12	1.92	1.31	1.60	NA
1.23	1.31	1.60	1.08	1.31	1.60	5/ 8
1.21	1.46	1.53	1.20	0.99	1.60	6/ 32
1.56	1.92	1.76	1.68	0.94	1.60	6/ 27
2.61	2.80	2.24	2.26	0.90	1.55	7/ 47
1.49	1.65	1.63	1.40	0.85	1.50	7/ 3
1.10-1.50				0.81	1.45	

iminary. 3/ Projected. 4/ Excludes support payments. 5/ Deficiency payments.
disaster payments.

Appendix table 7--Corn: Quarterly supply and disappearance, specifi

Year beginning September 1	Supply				
	Begin-ning stocks	Produc-tion	Imports	Total	Food, alcohol, a industria
1984/85					
Sept.-Nov.	1,006.3	7,672.1	0.7	8,679.1	249.7
Dec.-Feb.	6,631.1	---	0.1	6,631.2	241.5
Mar.-May	4,623.2	---	0.8	4,624.0	283.8
June-Aug.	2,835.5	---	0.1	2,835.6	295.0
Mkt. year	1,006.3	7,672.1	1.7	8,680.1	1,070.0
1985/86					
Sept.-Nov.	1,648.2	8,875.5	0.9	10,524.6	278.0
Dec.-Feb.	8,614.7	---	0.9	8,615.6	264.0
Mar.-May	6,587.1	---	2.2	6,589.3	293.0
June-Aug.	4,990.0	---	5.9	4,995.9	305.0
Mkt. year	1,648.2	8,875.5	9.9	10,533.6	1,140.0
1986/87					
Sept.-Nov.	4,039.5	8,225.8	0.7	12,266.0	280.0
Dec.-Feb.	10,305.5	---	0.2	10,305.7	270.0
Mar.-May	8,248.2	---	0.4	8,248.6	310.0
June-Aug.	6,332.2	---	0.4	6,332.6	315.0
Mkt. year	4,039.5	8,225.8	1.7	12,267.0	1,175.0
1987/88					
Sept.-Nov	4,881.7	7,131.3	0.5	12,013.5	292.0
Dec.-Feb.	9,771.0	---	0.7	9,771.7	282.0
Mar.-May	7,635.6	---	1.4	7,637.0	315.0
June-Aug.	5,839.2	---	0.8	5,840.0	323.0
Mkt. year	4,881.7	7,131.3	3.4	12,016.4	1,212.0
1988/89					
Sept.-Nov	4,259.1	4,928.7	0.6	9,188.4	294.0
Dec.-Feb.	7,071.6	---	0.6	7,072.2	284.0
Mar.-May	5,203.9	---	1.2	5,205.1	320.2
June-Aug.	3,419.3	---	0.4	3,419.7	328.2
Mkt. year	4,259.1	4,928.7	2.8	9,190.6	1,226.4
1989/90					
Sept.-Nov	1,930.4	7,527.2	0.6	9,458.2	298.0
Dec.-Feb.	7,079.2	---	0.5	7,079.7	295.0
Mar.-May	4,812.7	---	0.6	4,813.3	334.3
June-Aug.	2,839.4	---	0.4	2,839.8	333.7
Mkt. year 2/	1,930.4	7,527.2	2.1	9,459.7	1,261.0
1990/91:					
Mkt. year 3/	1,329.7	7,850.2	2.0	9,181.9	---1,3

--- = Not applicable.
1/ Includes quantity under loan and farmer-owned reserve. 2/ Prel

ecified periods, 1984/85-1990/91

Disappearance						Ending stocks		
Domestic use								
Food, ol, and strial	Seed	Feed and residual	Total	Exports	Total disappearance	Govt. owned	Privately owned 1/	Total
Million bushels								
49.7	0.0	1,295.1	1,544.8	503.2	2,048.0	206.7	6,424.4	6,631.1
41.5	0.0	1,186.1	1,427.6	580.4	2,008.0	209.7	4,413.5	4,623.2
83.8	17.0	1,013.0	1,313.8	474.7	1,788.5	221.7	2,613.8	2,835.5
95.0	4.2	596.3	895.5	291.9	1,187.4	224.9	1,423.3	1,648.2
70.0	21.2	4,090.5	5,181.7	1,850.2	7,031.9	224.9	1,423.3	1,648.2
78.0	0.0	1,217.1	1,495.1	414.8	1,909.9	388.6	8,226.1	8,614.7
64.0	0.0	1,304.3	1,568.3	460.2	2,028.5	509.4	6,077.7	6,587.1
93.0	16.1	1,088.8	1,397.9	201.4	1,599.3	550.9	4,439.1	4,990.0
05.0	3.4	497.1	805.5	150.9	956.4	545.7	3,493.8	4,039.5
40.0	19.5	4,107.3	5,266.8	1,227.3	6,494.1	545.7	3,493.8	4,039.5
80.0	0.0	1,362.3	1,642.3	318.2	1,960.5	968.2	9,337.3	10,305.5
70.0	0.0	1,474.7	1,744.7	312.8	2,057.5	1,362.2	6,886.0	8,248.2
10.0	16.4	1,093.9	1,420.3	496.1	1,916.4	1,491.5	4,840.7	6,332.2
15.0	0.3	770.3	1,085.6	365.3	1,450.9	1,443.2	3,438.5	4,881.7
75.0	16.7	4,701.2	5,892.9	1,492.4	7,385.3	1,443.2	3,438.5	4,881.7
92.0	0.0	1,554.9	1,846.9	395.6	2,242.5	1,683.4	8,087.6	9,771.0
82.0	0.0	1,449.4	1,731.4	404.7	2,136.1	1,767.7	5,867.9	7,635.6
15.0	16.7	956.4	1,288.1	509.7	1,797.8	1,304.9	4,534.3	5,839.2
23.0	0.5	851.0	1,174.5	406.4	1,580.9	835.0	3,424.1	4,259.1
12.0	17.2	4,811.7	6,040.9	1,716.4	7,757.3	835.0	3,424.1	4,259.1
94.0	0.0	1,352.0	1,646.0	470.8	2,116.8	611.0	6,460.6	7,071.6
84.0	0.0	1,081.7	1,365.7	502.6	1,868.3	465.0	4,738.9	5,203.9
20.2	16.8	857.2	1,194.2	591.6	1,785.8	417.7	3,001.6	3,419.3
28.2	1.9	695.8	1,025.9	463.4	1,489.3	362.5	1,567.9	1,930.4
26.4	18.7	3,986.7	5,231.8	2,028.4	7,260.2	362.5	1,567.9	1,930.4
98.0	0.0	1,498.7	1,796.7	582.3	2,379.0	628.2	6,451.0	7,079.2
95.0	0.0	1,290.4	1,585.4	681.6	2,267.0	537.2	4,275.5	4,812.7
34.3	16.7	1,022.1	1,373.1	600.8	1,973.9	299.3	2,540.1	2,839.4
33.7	2.3	688.8	1,024.8	485.3	1,510.1	225.0	1,104.7	1,329.7
61.0	19.0	4,500.0	5,780.0	2,350.0	8,130.0	225.0	1,104.7	1,329.7
--1,300.0---		4,600.0	5,900.0	2,075.0	7,975.0			1,206.9

/ Preliminary. 3/ Projected.

Appendix table 8--Sorghum: Marketing year supply and disappearance, speci

Year beginning September 1	Supply				Food, alcohol, and industrial
	Beginning stocks	Production	Imports	Total	
					Milli
1984/85					
Sept.-May	287.4	866.2	0.1	1,153.7	12.4
June-Aug.	360.8	0.0	0.0	360.8	2.9
Mkt. year	287.4	866.2	0.1	1,153.7	15.3
1985/86					
Sept.-May	300.2	1,120.3	0.0	1,420.5	22.1
June-Aug.	630.0	0.0	0.0	630.0	3.9
Mkt. year	300.2	1,120.3	0.0	1,420.5	26.0
1986/87					
Sept.-May	551.0	938.9	0.0	1,489.9	8.2
June-Aug.	835.0	0.0	0.0	835.0	2.2
Mkt. year	551.0	938.9	0.0	1,489.9	10.4
1987/88					
Sept.-May	743.3	730.8	0.0	1,474.1	14.2
June-Aug.	807.8	0.0	0.0	807.8	9.3
Mkt. year	743.3	730.8	0.0	1,474.1	23.5
1988/89					
Sept.-May	662.7	576.7	0.0	1,239.4	17.0
June-Aug.	559.0	0.0	0.0	559.0	3.5
Mkt. year	662.7	576.7	0.0	1,239.4	20.5
1989/90					
Sept.-Feb.	439.5	617.9	0.0	1,057.4	8.0
Mar.-May	513.6	0.0	0.1	513.7	2.5
June-Aug.	332.7	0.0	0.0	332.7	3.1
Mkt. year 2/	439.5	617.9	0.1	1,057.5	13.6
1990/91					
Mkt. year 3/	252.2	546.8	0.0	799.0	---15.0

1/ Includes quantity under loan and farmer-owned reserve. 2/ Prelimina

specified periods, 1984/85-1990/91

Disappearance					Ending stocks		
Domestic use			Exports	Total disappearance	Govt. owned	Privately owned 1/	Total
nd ial	Seed	Feed and residual	Total				
Million bushels							
	1.5	542.2	556.1	236.8	792.9	111.1	249.7	360.8
	0.5	(2.9)	0.5	60.1	60.6	112.1	188.1	300.2
	2.0	539.3	556.6	296.9	853.5	112.1	188.1	300.2
	1.2	626.9	650.2	140.3	790.5	181.4	448.6	630.0
	0.5	36.9	41.3	37.7	79.0	207.2	343.8	551.0
	1.7	663.8	691.5	178.0	869.5	207.2	343.8	551.0
	1.0	490.9	500.1	154.8	654.9	400.4	434.6	835.0
	0.6	45.4	48.2	43.5	91.7	409.0	334.3	743.3
	1.6	536.3	548.3	198.3	746.6	409.0	334.3	743.3
	0.8	466.0	481.0	185.3	666.3	535.0	272.8	807.8
	0.5	89.3	99.1	46.0	145.1	463.6	199.1	662.7
	1.3	555.3	580.1	231.3	811.4	463.6	199.1	662.7
	0.8	424.8	442.6	237.8	680.4	463.6	95.4	559.0
	0.7	43.2	47.4	72.1	119.5	340.9	98.6	439.5
	1.5	468.0	490.0	309.9	799.9	340.9	98.6	439.5
	0.0	360.8	368.8	175.0	543.8	223.0	290.6	513.6
	0.6	96.6	99.7	81.3	181.0	190.2	142.5	332.7
	0.5	48.0	51.6	28.9	80.5	150.0	102.2	252.2
	1.1	505.4	520.1	285.2	805.3	150.0	102.2	252.2
-15.0---		440.0	455.0	225.0	680.0			119.0

iminary. 3/ Projected.

Appendix table 9--Barley: Quarterly supply and disappearance, specif

Year beginning June 1	Supply				
	Beginning stocks	Production	Imports	Total	Food, alcohol, and industrial
1984/85:					
June-Aug.	189.4	598.0	2.7	790.1	39.9
Sept.-Nov.	639.0	---	0.9	639.9	34.6
Dec.-Feb.	484.9	---	2.3	487.2	34.2
Mar.-May	358.7	---	1.5	360.2	40.3
Mkt. year	189.4	598.0	7.4	794.8	149.0
1985/86:					
June-Aug.	247.4	590.2	0.7	838.3	39.1
Sept.-Nov.	698.3	---	1.3	699.6	33.7
Dec.-Feb.	572.1	---	2.5	574.6	33.7
Mar.-May	464.7	---	1.7	466.4	40.7
Mkt. year	247.4	590.2	6.2	843.8	147.2
1986/87:					
June-Aug.	327.2	608.5	1.3	937.0	42.2
Sept.-Nov.	786.8	---	1.0	787.8	36.5
Dec.-Feb.	634.3	---	1.2	635.5	35.8
Mar.-May	499.3	---	3.1	502.4	41.6
Mkt. year	327.2	608.5	6.6	942.3	156.1
1987/88:					
June-Aug.	336.3	521.5	1.1	858.9	42.8
Sept.-Nov.	725.0	---	2.9	727.9	37.1
Dec.-Feb.	582.4	---	4.3	586.7	36.3
Mar.-May	458.5	---	3.0	461.5	42.1
Mkt. year	336.3	521.5	11.3	869.1	158.3
1988/89:					
June-Aug.	321.1	290	2.8	613.9	45.2
Sept.-Nov.	450.4	---	2.2	452.6	39.4
Dec.-Feb.	372.1	---	2.8	374.9	37.2
Mar.-May	280.6	---	2.7	283.3	42.9
Mkt. year	321.1	290	10.5	621.6	164.7
1989/90:					
June-Aug.	196.4	403.4	3.6	603.4	46.7
Sept.-Nov.	416.9	---	2.0	418.9	40.1
Dec.-Feb.	350.6	---	4.4	355.0	38.0
Mar.-May	252.7	---	4.2	256.9	40.6
Mkt. year 1/	196.4	403.4	14.2	614.0	165.4
1990/91:					
Mkt. year 2/	161.0	402.5	15.0	578.5	---18

--- = Not applicable.
1/ Preliminary. 2/ Projected.

pecified periods, 1984/85-1990/91

	Disappearance					Ending stocks		
	Domestic use							
d, and rial	Seed	Feed and residual	Total	Exports	Total disappearance	Govt. owned	Privately owned 1/	Total
	Million bushels							
.9	0.0	100.1	140.0	11.1	151.1	12.2	626.8	639.0
.6	1.5	83.7	119.8	35.2	155.0	13.0	471.9	484.9
.2	1.7	71.6	107.5	21.0	128.5	14.2	344.5	358.7
.3	18.2	50.0	108.5	4.3	112.8	15.6	231.8	247.4
.0	21.4	305.4	475.8	71.6	547.4	15.6	231.8	247.4
.1	0.0	90.5	129.6	10.4	140.0	20.0	678.3	698.3
.7	1.5	85.1	120.3	7.2	127.5	36.1	536.0	572.1
.7	1.7	73.2	108.6	1.3	109.9	47.3	417.4	464.7
.7	18.1	79.6	138.4	0.8	139.2	57.4	269.8	327.2
.2	21.3	328.4	496.9	19.7	516.6	57.4	269.8	327.2
.2	0.0	94.5	136.7	13.5	150.2	56.0	730.8	786.8
.5	1.3	72.2	110.0	43.5	153.5	66.2	568.1	634.3
.8	1.4	67.2	104.4	31.8	136.2	75.2	424.1	499.3
.6	15.2	64.5	121.3	44.8	166.1	75.5	260.8	336.3
.1	17.9	298.4	472.4	133.6	606.0	75.5	260.8	336.3
.8	0.0	74.3	117.1	16.8	133.9	74.9	650.1	725.0
.1	1.1	64.8	103.0	42.5	145.5	79.5	502.9	582.4
.3	1.3	57.6	95.2	33.0	128.2	57.0	401.5	458.5
.1	13.3	56.4	111.8	28.6	140.4	50.1	271.0	321.1
.3	15.7	253.1	427.1	120.9	548.0	50.1	271.0	321.1
.2	0.0	92.5	137.7	25.8	163.5	35.9	414.5	450.4
.4	1.1	27.4	67.9	12.6	80.5	35.9	336.2	372.1
.2	1.2	40.6	79.0	15.3	94.3	34.1	246.5	280.6
.9	12.7	5.7	61.3	25.6	86.9	30.4	166.0	196.4
.7	15.0	166.2	345.9	79.3	425.2	30.4	166.0	196.4
.7	0.0	113.2	159.9	26.6	186.5	36.6	380.3	416.9
.1	1.0	10.0	51.1	17.2	68.3	36.3	314.3	350.6
.0	1.1	40.1	79.2	23.1	102.3	32.1	220.6	252.7
.6	12.3	20.9	73.8	22.1	95.9	19.0	142.0	161.0
.4	14.4	184.2	364.0	89.0	453.0	19.0	142.0	161.0
---185.5---		175.0	360.5	85.0	445.5			133.0

Appendix table 10--Average prices received by farmers, United States, by month, and loan rate, 1982-1989 1/

Year	Sept	Oct	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July 2/	Aug.	Average 3/	Loan rate
						$/bu.								
Corn:														
1982	2.15	1.98	2.13	2.26	2.36	2.56	2.71	2.95	3.03	3.04	3.13	3.35	2.55	2.55
1983	3.32	3.15	3.17	3.15	3.15	3.11	3.21	3.32	3.34	3.36	3.30	3.12	3.21	2.65
1984	2.90	2.65	2.55	2.56	2.64	2.62	2.67	2.70	2.68	2.64	2.60	2.44	2.63	2.55
1985	2.29	2.11	2.21	2.29	2.33	2.32	2.29	2.30	2.39	2.32	2.00	1.73	2.23	2.55
1986	1.45	1.40	1.47	1.50	1.48	1.42	1.47	1.52	1.66	1.69	1.60	1.47	1.50	1.92
1987	1.49	1.55	1.61	1.72	1.77	1.83	1.86	1.88	1.94	2.41	2.72	2.65	1.94	1.82
1988	2.60	2.58	2.51	2.53	2.60	2.59	2.60	2.56	2.58	2.52	2.47	2.27	2.54	1.77
1989	2.29	2.22	2.24	2.27	2.31	2.32	2.37	2.51	2.62	2.63	2.61		2.38	1.65
						$/cwt.								
Sorghum:														
1982	3.80	3.70	3.78	3.97	4.09	4.42	4.67	4.92	5.05	5.05	5.03	5.29	4.41	4.32
1983	5.26	5.01	4.98	4.93	4.92	4.74	4.85	5.00	5.08	4.94	4.64	4.58	4.89	4.50
1984	4.24	4.05	4.05	4.15	4.16	4.10	4.24	4.46	4.54	4.52	4.04	3.74	4.15	4.32
1985	3.27	3.30	3.47	3.76	3.69	3.55	3.67	3.80	3.99	3.43	3.06	2.66	3.45	4.32
1986	2.36	2.34	2.39	2.41	2.37	2.36	2.44	2.58	2.69	2.79	2.66	2.52	2.45	3.25
1987	2.43	2.48	2.69	2.72	2.75	2.88	2.92	2.94	2.91	4.13	4.56	4.41	3.04	3.11
1988	4.26	4.16	3.99	4.07	4.09	4.05	4.04	4.21	4.03	3.90	4.00	3.81	4.05	3.00
1989	3.80	3.61	3.68	3.54	3.58	3.54	3.70	3.89	4.04	4.29	4.26		3.79	2.80

Year	June	July 2/	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Average 3/	Loan rate
							$/bu.							
Oats:														
1982	1.88	1.57	1.39	1.35	1.32	1.40	1.44	1.46	1.48	1.49	1.54	1.54	1.49	1.31
1983	1.51	1.46	1.45	1.55	1.62	1.67	1.73	1.81	1.88	1.81	1.82	1.84	1.62	1.36
1984	1.80	1.68	1.62	1.60	1.69	1.64	1.72	1.74	1.69	1.68	1.68	1.60	1.67	1.31
1985	1.59	1.31	1.16	1.10	1.08	1.17	1.20	1.18	1.16	1.14	1.13	1.21	1.23	1.31
1986	1.10	0.90	0.86	0.99	1.10	1.32	1.44	1.46	1.47	1.45	1.50	1.57	1.21	0.99
1987	1.52	1.29	1.40	1.49	1.61	1.62	1.76	1.79	1.84	1.78	1.82	1.84	1.56	0.94
1988	2.63	2.86	2.54	2.57	2.56	2.41	2.47	2.52	2.46	2.41	2.24	2.13	2.61	0.90
1989	1.82	1.53	1.47	1.38	1.47	1.48	1.53	1.47	1.43	1.39	1.44	1.46	1.49	0.85
1990	1.34	1.22												
All barley:														
1982	2.39	2.16	2.20	2.17	1.98	2.06	2.19	2.16	2.00	2.09	2.22	2.36	2.18	2.08
1983	2.32	2.20	2.34	2.46	2.53	2.55	2.55	2.55	2.47	2.50	2.54	2.78	2.47	2.16
1984	2.61	2.54	2.26	2.25	2.29	2.25	2.19	2.24	2.21	2.18	2.16	2.22	2.29	2.08
1985	2.14	2.08	1.98	1.88	1.96	2.05	2.07	2.05	1.95	1.88	1.85	1.73	1.98	2.08
1986	1.57	1.67	1.51	1.45	1.58	1.69	1.62	1.60	1.63	1.69	1.69	1.76	1.61	1.56
1987	1.74	1.84	2.00	1.87	1.73	1.88	1.83	1.78	1.72	1.65	1.74	1.79	1.81	1.49
1988	2.45	2.97	2.96	2.94	2.86	2.96	2.73	2.74	2.67	2.74	2.73	2.64	2.80	1.44
1989	2.34	2.16	2.70	2.47	2.41	2.47	2.47	2.33	2.33	2.19	2.22	2.38	2.42	1.34
1990	2.28	2.01												

Year	June	July 2/	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
							$/bu.					
Feed barley:												
1982	2.52	2.23	1.98	1.91	1.87	1.94	1.98	2.07	1.99	2.08	2.26	2.43
1983	2.52	2.31	2.23	2.41	2.45	2.51	2.52	2.58	2.47	2.54	2.55	2.86
1984	2.72	2.60	2.10	2.13	2.19	2.19	2.20	2.22	2.27	2.19	2.16	2.30
1985	2.26	2.05	1.75	1.74	1.85	1.90	2.03	2.00	1.90	1.83	1.85	1.81
1986	1.61	1.44	1.21	1.33	1.49	1.62	1.59	1.56	1.61	1.69	1.71	1.84
1987	1.79	1.67	1.54	1.57	1.66	1.68	1.63	1.65	1.64	1.59	1.73	1.76
1988	2.07	2.34	2.37	2.39	2.34	2.30	2.27	2.28	2.29	2.35	2.32	2.27
1989	2.18	1.96	2.06	1.98	1.97	2.09	2.10	2.02	2.08	1.99	2.08	2.28
1990	2.25	1.97										
Malting barley:												
1982	2.26	2.10	2.38	2.58	2.22	2.26	2.39	2.32	2.00	2.09	2.13	2.18
1983	2.05	2.06	2.50	2.69	2.72	2.61	2.61	2.50	2.47	2.46	2.54	2.53
1984	2.52	2.48	2.50	2.52	2.52	2.39	2.18	2.29	2.11	2.17	2.17	2.10
1985	2.02	2.13	2.49	2.33	2.24	2.32	2.19	2.13	1.99	1.93	1.85	1.66
1986	1.52	2.07	2.23	1.85	1.83	1.78	1.65	1.70	1.69	1.69	1.65	1.66
1987	1.68	2.04	2.55	2.39	1.88	2.07	2.01	2.15	1.80	1.69	1.75	1.81
1988	2.80	3.26	3.38	3.47	3.41	3.34	3.27	3.32	3.22	3.22	3.16	3.04
1989	2.62	2.68	3.04	2.87	2.89	2.90	2.88	2.73	2.61	2.45	2.50	2.58
1990	2.37	2.07										

1/ Prices do not include an allowance for loans outstanding and Government purchases. 2/ July 1990 is preliminary. 3/ U.S. season average prices based on monthly prices weighted by monthly marketings.

Source: Agricultural Prices, Agricultural Statistics Board, USDA.

Appendix table 11--Cash prices at principal markets, 1985-1989

Year	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Average
						$/bu.							
Corn, no. 2 yellow, Central Illinois:													
1985	2.28	2.10	2.32	2.36	2.36	2.33	2.29	2.31	2.42	2.41	1.93	1.52	2.22
1986	1.34	1.34	1.55	1.52	1.44	1.38	1.46	1.56	1.75	1.74	1.60	1.46	1.51
1987	1.52	1.65	1.74	1.78	1.85	1.89	1.92	1.92	1.97	2.59	2.90	2.73	2.04
1988	2.70	2.71	2.56	2.60	2.65	2.60	2.65	2.57	2.62	2.54	2.49	2.29	2.58
1989	2.33	2.26	2.30	2.29	2.30	2.37	2.42	2.64	2.73	2.77	2.68		
Corn, no. 2 yellow, Gulf Ports:													
1985	2.59	2.50	2.69	2.75	2.72	2.63	2.56	2.57	2.68	2.63	2.12	1.85	2.52
1986	1.68	1.66	1.83	1.81	1.73	1.70	1.83	1.89	2.06	2.06	1.95	1.81	1.83
1987	1.86	1.99	2.08	2.11	2.20	2.23	2.29	2.28	2.29	3.05	3.22	3.02	2.39
1988	3.08	3.07	2.89	2.99	3.01	2.99	3.02	2.93	2.99	2.87	2.73	2.57	2.93
1989	2.62	2.99	2.75	2.76	2.69	2.70	2.72	3.01	3.08	3.05	2.92		
Corn, no. 2 yellow, St. Louis:													
1985	2.38	2.27	2.50	2.59	2.55	2.50	2.42	2.46	2.56	2.52	2.01	1.67	2.37
1986	1.47	1.46	1.68	1.69	1.61	1.57	1.65	1.74	1.93	1.92	1.79	1.65	1.68
1987	1.65	1.78	1.91	1.97	2.05	2.07	2.09	2.10	2.13	2.77	2.96	2.81	2.19
1988	2.82	2.82	2.70	2.76	2.81	2.79	2.82	2.76	2.83	2.58	2.57	2.38	2.72
1989	2.38	2.44	2.48	2.44	2.45	2.48	2.57	2.77	2.86	2.85	2.75		
Sorghum, no.2 yellow, Gulf Ports 1/:													
1985	3.70	3.97	4.34	4.52	4.45	4.30	4.28	4.50	4.80	3.90	3.37	2.71	4.07
1986	2.95	3.15	3.26	3.15	3.05	3.09	3.35	3.30	3.51	3.50	3.30	3.04	3.22
1987	3.13	3.35	3.55	3.50	3.65	3.80	3.86	3.70	3.73	5.00	5.33	4.93	3.96
1988	4.99	4.91	4.64	4.93	4.99	4.99	5.02	4.89	5.05	4.75	4.02	4.53	4.81
1989	4.67	4.61	4.69	4.70	4.62	4.59	4.70	4.97	5.04	4.87	4.95		
						$/cwt							
Sorghum, no. 2 yellow, Kansas City:													
1985	3.56	3.62	3.75	3.97	3.95	3.80	3.82	4.00	4.25	4.00	3.20	2.71	3.72
1986	2.47	2.60	2.70	2.62	2.50	2.57	2.80	2.85	3.10	3.20	2.80	2.55	2.73
1987	2.64	2.75	2.90	2.95	3.05	3.24	3.27	3.16	3.21	4.58	4.79	4.28	3.40
1988	4.27	4.17	4.00	4.23	4.24	4.26	4.32	4.17	4.29	4.15	3.96	3.92	4.17
1989	3.96	3.91	4.00	3.98	4.00	3.84	4.02	4.32	4.47	4.54	4.82		
Sorghum, no. 2 yellow, Texas High Plains:													
1985	4.19	4.38	4.30	4.49	4.47	4.36	4.33	4.48	4.77	4.84	3.93	3.36	4.33
1986	3.35	3.24	2.97	3.06	2.94	2.89	3.06	3.32	3.56	3.60	3.58	3.30	3.24
1987	3.19	3.27	3.27	3.39	3.40	3.53	3.56	3.54	3.55	4.84	5.25	4.96	3.81
1988	4.98	4.95	4.62	4.63	4.75	4.69	4.72	4.63	4.50	4.59	4.46	4.44	4.66
1989	4.39	4.61	4.69	4.03	4.04	4.02	4.10	4.38	4.67	4.70	4.48		

Year	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Average
						$/bu.							
Barley, no. 3 or better malting, 65% or better plump, Minneapolis:													
1985	2.46	2.25	2.03	2.15	2.10	2.27	2.29	2.28	2.20	2.34	2.40	2.07	2.24
1986	1.84	1.75	1.61	1.76	1.93	2.02	1.88	1.81	1.92	2.01	2.05	2.12	1.89
1987	2.07	1.93	1.73	1.98	2.08	2.05	2.01	2.02	2.15	2.08	2.11	2.24	2.04
1988	3.61	3.87	4.25	4.40	4.39	4.14	3.82	4.14	4.19	4.33	4.29	3.84	4.11
1989	3.02	3.33	3.57	3.43	3.48	3.18	3.19	3.20	3.02	2.83	2.97	3.17	3.20
1990	2.92	2.36											
Barley, no. 2 feed, Minneapolis 2/, 3/:													
1985	1.90	1.66	1.46	1.40	1.41	1.49	1.60	1.57	NA	NA	NA	1.31	1.53
1986	1.23	1.16	1.13	1.27	1.50	1.63	1.23	NA	NA	1.64	1.76	1.86	1.44
1987	1.73	1.59	1.60	1.76	1.78	1.82	1.74	1.72	1.77	1.88	1.94	1.98	1.78
1988	2.41	2.28	2.08	2.24	2.32	2.27	2.14	2.24	2.33	2.49	2.52	2.41	2.31
1989	2.12	2.11	2.17	2.13	2.16	2.15	2.23	2.28	2.22	2.27	2.27	2.33	2.20
1990	2.39	2.17											
Oats, no. 2 heavy white, Minneapolis:													
1985	1.59	1.44	1.23	1.24	1.19	1.32	1.39	1.37	1.30	1.27	1.16	1.22	1.31
1986	1.18	1.05	1.12	1.29	1.39	1.72	1.66	1.64	1.56	1.46	1.59	1.83	1.46
1987	1.64	1.61	1.77	1.85	1.97	2.05	2.02	2.10	2.06	1.93	1.94	2.12	1.92
1988	3.26	3.25	3.09	3.07	2.99	2.71	2.74	2.87	2.59	2.49	2.30	2.22	2.80
1989	1.97	1.72	1.59	1.58	1.61	1.68	1.70	1.56	1.48	1.57	1.63	1.68	1.65
1990	1.52	1.37											

NA = Not available.
1/ Rail delivered to Texas Gulf. 2/ Prior to June 1977 reported as barley, no. 3 or better. 3/ Reporting point changed from Minneapolis #2 feed to Duluth #2 feed beginning March 1987.

Source: Grain and Feed Market News, Agricultural Marketing Service, USDA.

Appendix table 12--Feed-price ratios for livestock, poultry, and milk, by months, 1982-1989

Year	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July 1/	Aug.	Average
Hog/corn, U.S. basis 2/:													
1982	28.50	28.20	24.60	23.70	23.40	21.90	18.60	15.90	15.10	14.40	13.90	13.90	20.17
1983	13.30	12.80	11.80	14.00	15.40	14.60	14.30	14.30	14.10	14.60	15.80	16.20	14.27
1984	16.00	16.50	18.40	19.00	18.20	18.40	16.30	15.30	15.40	16.90	17.60	17.40	17.12
1985	17.30	20.40	19.50	19.80	19.00	18.40	17.60	17.30	19.20	22.70	29.50	35.90	21.38
1986	40.20	37.90	35.90	33.70	31.90	33.90	32.20	33.40	32.80	35.00	37.30	39.90	35.34
1987	36.40	31.50	25.20	23.40	24.30	25.00	22.70	22.30	23.90	19.50	16.20	16.90	23.94
1988	15.70	15.00	14.40	15.70	15.70	15.60	15.10	14.40	16.10	17.90	18.60	20.10	16.19
1989	19.00	21.00	20.10	21.20	20.50	20.80	21.60	21.40	23.40	22.90	23.00		
Beef-steer/corn, Omaha 3/:													
1982	27.50	27.70	25.10	25.20	24.50	23.40	22.70	21.90	21.80	21.20	19.60	18.10	23.23
1983	17.80	18.40	18.30	19.80	21.60	22.10	21.10	20.40	19.70	19.10	20.40	20.70	19.95
1984	21.30	22.40	24.60	25.60	24.80	24.10	22.20	21.50	21.50	21.00	20.40	21.70	22.59
1985	21.80	25.70	27.80	26.70	25.60	24.40	24.00	22.90	23.00	22.30	28.90	36.70	25.82
1986	42.10	42.70	39.70	38.80	40.80	43.90	41.90	42.20	40.20	38.90	41.40	43.90	41.38
1987	42.10	41.40	38.40	36.70	36.40	37.40	38.20	39.40	38.60	29.50	24.40	26.10	35.72
1988	26.40	26.40	28.40	27.90	28.10	28.70	29.40	30.20	29.30	29.10	29.60	32.00	28.79
1989	30.80	31.10	32.20	32.80	34.20	34.00	32.60	31.10	29.30	27.90	28.50		
Milk/feed, U.S. basis 4/:													
1982	1.57	1.61	1.62	1.60	1.59	1.56	1.55	1.49	1.45	1.43	1.45	1.41	1.53
1983	1.36	1.39	1.36	1.34	1.33	1.33	1.34	1.32	1.32	1.32	1.35	1.40	1.35
1984	1.48	1.56	1.62	1.59	1.57	1.57	1.55	1.51	1.47	1.45	1.44	1.47	1.52
1985	1.51	1.56	1.55	1.53	1.48	1.50	1.48	1.48	1.46	1.45	1.51	1.55	1.51
1986	1.61	1.75	1.77	1.77	1.73	1.69	1.63	1.61	1.57	1.57	1.56	1.58	1.65
1987	1.64	1.65	1.65	1.63	1.51	1.47	1.43	1.40	1.37	1.36	1.15	1.19	1.45
1988	1.26	1.32	1.36	1.38	1.38	1.35	1.30	1.29	1.28	1.29	1.37	1.43	1.33
1989	1.52	1.63	1.71	1.76	1.69	1.55	1.47	1.48	1.49	1.52	1.56		
Egg/feed, U.S. basis 5/:													
1982	6.00	6.30	6.30	6.00	5.70	5.80	6.10	5.80	6.00	5.80	5.70	6.10	5.97
1983	6.00	6.20	6.90	7.70	8.80	8.50	7.40	8.50	6.50	5.80	5.80	5.80	6.99
1984	5.90	5.70	6.50	6.30	5.50	5.60	6.30	5.70	5.50	5.90	5.90	6.50	5.94
1985	7.10	7.30	7.50	7.40	7.20	6.90	7.60	6.40	6.40	5.70	6.90	7.30	6.98
1986	7.30	7.00	8.00	7.80	7.30	7.10	6.60	6.60	5.90	6.00	5.70	5.60	6.74
1987	6.50	6.00	6.40	5.70	5.60	5.30	5.60	5.20	5.00	5.30	4.90	4.90	5.53
1988	5.40	5.30	5.40	5.40	6.00	5.80	7.40	6.30	5.90	6.10	6.20	6.90	6.01
1989	6.80	7.20	7.90	8.30	8.40	7.10	8.00	6.60	5.20	5.60	5.40		
Broiler/feed, U.S. basis 6/:													
1982	2.60	2.50	2.50	2.50	2.60	2.70	2.40	2.30	2.40	2.60	2.80	2.80	2.56
1983	2.70	2.50	2.80	2.90	3.10	3.10	3.10	2.70	2.70	2.70	3.00	2.70	2.83
1984	2.80	2.60	2.80	2.70	2.90	2.90	2.80	2.80	3.10	3.20	3.10	3.10	2.90
1985	3.20	3.10	3.50	3.20	3.20	3.10	3.10	3.10	3.40	3.80	4.50	4.60	3.48
1986	3.80	4.40	3.90	3.40	3.60	3.50	3.30	3.20	3.30	3.00	2.90	3.30	3.47
1987	2.90	2.60	2.70	2.50	2.80	2.70	2.80	3.10	3.70	4.10	3.40	3.40	3.06
1988	3.20	2.80	2.70	2.80	2.80	2.80	3.10	3.30	3.70	3.50	3.30	3.00	3.08
1989	3.10	2.70	2.60	2.60	2.70	3.00	3.30	3.10	3.20	3.10	3.30		
Turkey/feed, U.S. basis 7/:													
1982	3.80	3.90	3.90	3.00	2.90	2.90	2.90	2.70	2.90	3.00	2.80	2.80	3.13
1983	3.00	3.00	3.10	3.50	3.60	3.20	3.30	3.30	3.30	3.30	3.60	3.80	3.33
1984	3.90	4.40	5.00	5.50	4.70	3.80	3.70	3.70	3.70	3.90	4.20	4.50	4.25
1985	5.00	5.50	5.50	5.50	3.40	3.40	3.50	3.50	3.80	4.30	4.50	4.60	4.38
1986	4.70	4.90	4.80	4.00	3.30	3.40	3.40	3.50	3.40	3.30	3.10	3.00	3.73
1987	2.90	2.80	3.10	3.60	2.90	2.60	2.50	2.70	2.80	3.00	3.00	3.10	2.92
1988	3.40	3.60	3.60	2.90	2.70	3.00	3.10	3.40	3.50	3.50	3.30	3.30	3.28
1989	2.90	3.10	3.40	3.20	3.00	2.80	3.10	3.10	3.20	3.20	3.20		

1/ July 1990 is preliminary. 2/ Bushels of corn equal in value to 100 pounds of hog, live weight. 3/ Based on price choice beef-steers, 900-1100 pounds. 4/ Pounds of 16-percent mixed dairy feed equal in value to 1 pound whole milk. 5/ Pounds of laying feed equal in value to 1 dozen eggs. 6/ Pounds of broiler grower feed equal in value to 1 pound broiler, live weight. 7/ Pounds of turkey grower feed equal in value to 1 pound of turkey, live weight.

Sources: Agricultural Prices, Agricultural Statistics Board, USDA.
Livestock, Meat & Wool Market News, Agricultural Marketing Service, USDA.

Table 13--Price trends, selected feeds, and corn products

Item	Unit	Sept.-Aug. 1988/89 1/	1990						
			Jan.	Feb.	Mar.	Apr.	May	June	July
Wholesale, mostly bulk 2/:									
Soybean meal, 44% solvent, Decatur	$/ton	216.76	172.30	161.90	165.10	165.40	176.20	169.10	171.32
Soybean meal, high protein, Decatur	"	256.50	183.80	172.90	176.40	178.00	189.40	182.00	183.92
Cottonseed meal, 41% solvent, Memphis	"	188.05	160.00	150.00	146.25	150.00	155.00	147.50	161.50
Linseed meal, 34% solvent, Minneapolis	"	166.31	132.50	124.50	126.25	133.75	143.00	142.50	136.00
Meat and bone meal, Kansas City	"	259.83	194.60	194.40	199.40	199.10	199.20	203.50	205.50
Fishmeal, 67% protein, East Coast	"	445.28	388.50	389.40	387.50	320.60	341.00	313.75	309.50
Corn gluten feed, Illinois pts.	"	117.32	110.30	108.75	108.75	102.10	95.00	81.25	83.40
Corn gluten meal, 60% protein, Illinois pts.	"	282.49	281.00	260.90	238.75	238.10	240.50	215.60	222.00
Brewers' dried grains, Milwaukee	"	128.45	128.50	93.00	84.40	81.90	83.50	82.90	78.50
Distillers' dried grains, Lawrenceburg, Indiana	"	129.26	122.00	120.25	115.25	117.25	119.60	120.75	119.00
Feather meal, Arkansas pts.	"	257.95	237.00	207.20	199.40	207.50	182.40	170.50	181.00
Wheat bran, Kansas City	"	85.98	89.30	74.00	71.50	79.10	81.90	69.75	72.30
Wheat middlings, Kansas City	"	85.98	89.30	74.00	71.50	79.10	81.90	69.75	72.30
Rice bran, f.o.b. mills, Arkansas	"	64.82	83.10	54.00	52.60	60.20	72.10	74.40	95.30
Hominy feed, Illinois pts.	"	91.66	85.80	82.90	89.60	94.10	94.40	92.00	87.70
Alfalfa meal, dehydrated, Kansas City	"	136.68	136.00	136.25	136.00	133.75	126.80	118.50	113.20
Cane molasses, New Orleans	"	61.80	52.75	53.10	52.50	54.25	57.20	57.50	62.75
Molasses beet pulp, Los Angeles	"	114.01	NQ	NQ	118.00	118.00	118.00	117.25	117.20
Animal fat, Kansas City	c/lb.	11.53	11.20	11.60	11.70	11.40	10.90	11.50	11.60
Urea, 42% nitrogen, Forth Worth	$/ton	206.33	195.00	205.75	205.00	201.67	196.67	200.00	200.00
Corn, no. 2 white, Kansas City	$/bu.	3.77	3.00	3.00	3.00	2.95	2.90	3.17	3.12
Prices paid, U.S. basis 3/ 4/:									
Soybean meal, 44%	$/cwt	16.20	13.50	---	---	12.70	---	---	14.00
Cottonseed meal, 41%	"	15.50	15.00	---	---	14.50	---	---	14.70
Wheat bran	"	10.83	10.90	---	---	10.80	---	---	10.80
Wheat middlings	"	9.52	9.70	---	---	9.47	---	---	9.65
Broiler grower feed	$/ton	244.25	224.00	---	---	217.00	---	---	221.00
Laying feed	"	214.25	199.00	---	---	195.00	---	---	206.00
Turkey grower feed	"	257.75	239.00	---	---	239.00	---	---	240.00
Chick starter	"	246.75	227.00	---	---	223.00	---	---	234.00
Dairy feed, 16%	"	192.25	186.00	---	---	181.00	---	---	181.00
Beef cattle concentrate, 32-36% protein 5/	"	268.25	262.00	---	---	250.00	---	---	250.00
Hog concentrate, 38-42% protein 5/	"	355.75	311.00	---	---	296.00	---	---	303.00
Stock salt 5/	50 lb	3.36	3.42	---	---	3.47	---	---	3.52
Corn products, wholesale 6/:									
Corn meal, yellow, New York	$/cwt	13.16	13.11	13.12	13.28	13.77	13.93	13.91	13.78
Grits (brewers'), Chicago	"	10.06	9.98	9.99	10.12	10.50	10.68	10.66	10.51
Syrup, Midwest/West	c/lb.	10.98	10.65	11.21	11.71	11.71	11.72	11.93	12.53
Sugar (dextrose), Midwest	"	24.72	24.50	24.50	24.50	24.50	24.50	24.50	24.50
High-fructose (dried weight in tank cars), Midwest	"	13.39	12.46	12.46	12.84	14.38	14.38	14.76	16.29
Corn starch, f.o b. Midwest	$/cwt	10.25	10.00	10.00	10.25	10.50	11.00	11.48	11.81

--- = Not applicable.
1/ Preliminary. 2/ Grain and Feed Market News, Agricultural Marketing Service, USDA, except urea which is from Feedstuffs, Miller Publishing Co., Minneapolis, Minnesota. 3/ Agricultural Prices, Agricultural Statistics Board, USDA. 4/ Prices paid data is available on a quarterly basis only. 5/ Prices previously published in cwt. 6/ Milling and Baking News, Kansas City, Missouri, except starch which is from industry sources.

Appendix table 14--Corn, sorghum, barley, and oats exports, 1987/88 to date 1/--Continued

Year and month	Corn		Sorghum	Year and month	Barley		Oats	
	Grain only	Total			Grain only	Total	Grain only	Total
	Bushels				Bushels			
1987/88				1987/88				
Sept.	135,401,494	136,128,505	17,831,044	June	517,681	742,738	104,217	187,886
Oct.	137,692,620	138,784,114	16,734,001	July	7,421,463	7,675,579	50,113	92,430
Nov.	122,467,307	123,085,243	10,968,017	Aug.	8,893,825	9,257,652	18,135	153,171
1st Qtr.	395,561,421	397,997,861	45,533,062	1st Qtr.	16,832,969	17,675,969	172,465	433,487
Dec.	148,173,110	149,269,833	21,239,967	Sept.	9,658,418	10,363,963	36,051	74,210
Jan.	133,336,988	134,196,121	19,399,501	Oct.	16,149,719	17,238,723	62,220	144,789
Feb.	123,237,769	124,218,907	22,498,453	Nov.	16,700,948	18,605,946	38,617	99,130
2nd Qtr.	404,747,867	407,684,861	63,137,921	2nd Qtr.	42,509,085	46,208,631	136,888	318,129
Mar.	164,083,150	165,253,019	24,662,618	Dec.	15,583,102	16,123,445	5,680	36,703
Apr.	166,222,992	166,980,188	30,324,679	Jan.	10,672,812	10,910,229	96,376	147,370
May	179,365,299	180,377,177	22,103,010	Feb.	6,764,525	7,239,965	29,937	148,578
3rd Qtr.	509,671,441	512,610,384	77,090,307	3rd Qtr.	33,020,439	34,273,639	131,993	332,652
June	132,934,667	133,784,539	13,740,797	Mar.	15,349,596	15,756,272	24,173	49,618
July	122,945,548	124,276,098	20,243,604	Apr.	8,796,666	9,029,851	12,420	114,674
Aug.	150,564,179	151,445,670	11,836,824	May	4,470,071	4,979,881	22,950	215,233
4th Qtr.	406,444,394	409,506,307	45,821,225	4th Qtr.	28,616,333	29,766,004	59,543	379,525
Total	1,716,425,123	1,727,799,413	231,582,515	Total	120,978,826	127,924,243	500,889	1,463,793
1988/89				1988/89				
Sept.	150,843,842	151,736,284	26,656,522	June	12,108,210	12,402,962	102,245	258,289
Oct.	170,295,536	171,523,785	19,499,969	July	11,513,586	11,757,762	38,739	88,239
Nov.	149,632,839	151,030,488	18,319,440	Aug.	2,214,904	2,500,232	24,394	145,962
1st Qtr.	470,772,217	474,290,557	64,475,931	1st Qtr.	25,836,700	26,660,956	165,378	492,490
Dec.	172,492,326	173,546,904	27,975,619	Sept.	8,758,198	8,833,519	21,017	90,049
Jan.	175,221,513	176,487,573	32,501,841	Oct.	1,432,089	2,161,176	30,378	57,096
Feb.	154,909,994	158,177,973	33,002,703	Nov.	2,452,268	3,055,490	73,371	126,759
2nd Qtr.	502,623,833	508,212,450	93,480,163	2nd Qtr.	12,642,555	14,050,185	124,766	273,904
Mar.	202,840,169	206,563,860	30,648,140	Dec.	15,121,435	15,440,102	29,605	51,848
Apr.	177,475,933	180,898,856	28,248,011	Jan.	84,517	417,785	115,957	154,015
May	211,303,127	212,764,901	21,239,060	Feb.	81,490	439,958	65,245	112,585
3rd Qtr.	591,619,229	600,227,617	80,135,211	3rd Qtr.	15,287,442	16,297,845	210,807	318,448
June	223,487,607	225,359,132	24,105,107	Mar.	1,964,297	2,424,381	22,487	70,294
July	133,145,813	135,157,047	25,119,434	Apr.	13,817,421	14,373,832	27,765	69,774
Aug.	106,804,440	109,287,340	22,869,115	May	9,781,368	10,571,462	27,121	60,581
4th Qtr.	463,437,860	469,803,519	72,093,656	4th Qtr.	25,563,086	27,369,675	77,373	200,649
Total	2,028,453,139	2,052,534,143	310,184,961	Total	79,329,783	84,378,661	578,324	1,285,491
1989/90				1989/90				
Sept.	113,776,974	116,262,446	37,711,379	June	7,412,020	8,169,340	73,555	134,619
Oct.	174,744,707	177,648,151	33,729,330	July	9,666,205	10,690,552	99,550	154,363
Nov.	293,764,931	296,074,486	22,408,755	Aug.	9,513,210	9,985,797	60,059	185,406
1st Qtr.	582,286,612	589,985,083	93,849,464	1st Qtr.	26,591,435	28,845,689	233,164	474,388
Dec.	258,806,792	260,538,272	19,612,697	Sept.	8,060,139	9,274,483	137,368	245,862
Jan.	239,115,226	241,832,437	33,378,612	Oct.	4,634,063	5,354,195	86,668	183,582
Feb.	183,701,798	186,664,605	28,182,429	Nov.	4,520,961	5,397,789	46,922	103,742
2nd Qtr.	681,623,816	689,035,314	81,173,738	2nd Qtr.	17,215,163	20,026,467	270,958	533,185
Mar.	192,735,660	195,963,452	31,489,112	Dec.	9,913,639	10,571,944	55,999	83,079
Apr.	193,839,027	198,739,081	27,544,536	Jan.	6,243,980	7,000,416	59,397	93,083
May	214,184,922	216,778,666	22,232,389	Feb.	6,895,254	7,084,286	36,769	65,525
3rd Qtr.	600,759,609	611,481,199	81,266,037	3rd Qtr.	23,052,873	24,656,646	152,165	241,687
June	201,188,588	204,096,201	12,501,897	Mar.	4,789,751	5,024,081	66,607	102,001
July				Apr.	8,399,072	9,812,500	72,009	110,947
Aug.				May	8,907,697	9,086,501	32,389	63,663
4th Qtr.	201,188,588	204,096,201	12,501,897	4th Qtr.	22,096,520	23,923,082	171,005	276,611
Total	2,065,858,625	2,094,597,797	268,791,136	Total	88,955,991	97,451,884	827,292	1,525,871
1990/91				1990/91				
Sept.				June	11,117,511	11,513,895	97,249	1,570,662

1/ Total corn exports include grain only (white, yellow, seed, relief), dry process (cornmeal for relief, as grain, grits), and wet process (corn starch, sugar dextrose, glucose, high fructose). Sorghum includes seed and unmilled. Barley includes grain only (grain for malting purposes, other) and barley malt. Oats include grain and oatmeal (bulk and packaged).

Source: Bureau of the Census, U.S. Department of Commerce.

Appendix table 15--Corn, sorghum, barley, and oats imports, 1987/88 to date 1/

Year and month	Corn		Sorghum	Year and month	Barley		Oats	
	Grain only	Total			Grain only	Total	Grain only	Total
	Bushels				Bushels			
1987/88				1987/88				
Sept.	130,361	151,725	0	June	683,655	895,759	3,730,421	3,760,272
Oct.	354,333	373,790	24	July	195,998	445,492	1,717,932	1,735,424
Nov.	77,145	101,481	15	Aug.	220,222	434,668	1,541,932	1,582,741
1st Qtr.	561,839	626,996	39	1st Qtr.	1,099,875	1,775,919	6,990,285	7,078,437
Dec.	246,126	298,521	0	Sept.	1,061,243	1,396,437	1,712,779	1,744,204
Jan.	126,012	167,032	0	Oct.	926,329	1,222,581	1,270,484	1,372,822
Feb.	332,569	388,773	19	Nov.	876,498	1,209,701	5,106,952	5,148,944
2nd Qtr.	704,707	854,326	19	2nd Qtr.	2,864,070	3,828,719	8,090,215	8,265,970
Mar.	593,592	683,203	12	Dec.	1,146,248	1,384,778	2,537,116	2,566,987
Apr.	662,637	739,543	50	Jan.	1,846,528	2,038,574	4,086,315	4,154,507
May	113,606	140,762	0	Feb.	1,318,218	1,605,421	9,164,122	9,210,252
3rd Qtr.	1,369,835	1,563,508	62	3rd Qtr.	4,310,994	5,028,773	15,787,553	15,931,746
June	347,181	376,601	0	Mar.	1,163,560	1,280,709	6,426,933	6,482,646
July	257,479	275,042	0	Apr.	986,537	1,063,805	3,701,098	3,737,802
Aug.	169,701	207,314	7,229	May	876,452	961,089	4,721,106	4,756,988
4th Qtr.	774,361	858,957	7,229	4th Qtr.	3,026,549	3,305,603	14,849,137	14,977,436
Total	3,410,742	3,903,787	7,349	Total	11,301,488	13,939,014	45,717,190	46,253,589
1988/89				1988/89				
Sept.	148,437	177,913	0	June	1,596,106	1,700,185	5,680,015	5,772,502
Oct.	296,701	308,058	3,673	July	930,207	1,029,127	2,276,583	2,365,501
Nov.	180,789	233,514	0	Aug.	317,223	417,363	4,298,356	4,485,006
1st Qtr.	625,927	719,485	3,673	1st Qtr.	2,843,536	3,146,675	12,254,954	12,623,009
Dec.	106,151	173,241	0	Sept.	240,729	365,319	2,059,442	2,367,645
Jan.	307,023	723,699	0	Oct.	402,245	555,196	3,995,388	4,239,340
Feb.	178,260	591,385	15,130	Nov.	1,523,621	1,651,752	5,834,991	6,184,617
2nd Qtr.	591,434	1,488,325	15,130	2nd Qtr.	2,166,595	2,572,267	11,889,821	12,791,602
Mar.	420,381	742,935	0	Dec.	490,420	578,085	4,696,591	5,153,441
Apr.	633,060	845,387	5	Jan.	729,443	838,489	6,100,483	6,906,243
May	162,021	356,329	0	Feb.	1,627,551	1,720,819	9,313,487	10,172,629
3rd Qtr.	1,215,462	1,944,651	5	3rd Qtr.	2,847,414	3,137,393	20,110,561	22,232,313
June	33,363	212,637	14	Mar.	762,924	851,359	7,169,256	8,042,377
July	223,459	382,968	0	Apr.	753,742	857,654	4,750,564	5,431,135
Aug.	93,469	348,056	0	May	1,136,714	1,239,385	6,723,912	7,307,316
4th Qtr.	350,291	943,661	14	4th Qtr.	2,653,380	2,948,398	18,643,732	20,780,828
Total	2,783,114	5,096,122	18,822	Total	10,510,925	11,804,733	62,899,068	68,427,752
1989/90				1989/90				
Sept.	38,078	278,865	0	June	1,649,125	1,745,195	3,146,832	3,791,155
Oct.	307,119	553,242	0	July	571,185	661,468	6,440,929	6,730,677
Nov.	297,019	545,010	0	Aug.	1,356,499	1,456,086	7,372,277	7,823,880
1st Qtr.	642,216	1,377,117	0	1st Qtr.	3,576,809	3,862,749	16,960,038	18,345,712
Dec.	196,134	568,554	0	Sept.	263,515	360,996	5,871,691	6,236,194
Jan.	247,828	427,823	0	Oct.	204,334	283,661	4,460,867	4,779,170
Feb.	92,762	248,372	0	Nov.	1,517,596	1,674,049	7,146,334	7,452,067
2nd Qtr.	536,724	1,244,749	0	2nd Qtr.	1,985,445	2,318,706	17,478,892	18,467,431
Mar.	182,222	320,108	74,979	Dec.	2,157,989	2,471,341	13,163,137	13,441,248
Apr.	162,070	340,157	826	Jan.	823,485	951,218	4,913,651	5,106,850
May	275,032	540,454	42,236	Feb.	1,396,491	1,556,043	4,198,054	4,343,569
3rd Qtr.	619,324	1,200,719	118,041	3rd Qtr.	4,377,965	4,978,602	22,274,842	22,891,667
June	33,491	302,083	23,864	Mar.	1,412,309	1,513,346	3,990,713	4,076,976
July				Apr.	1,333,963	1,417,784	8,366,698	8,475,874
Aug.				May	1,468,205	1,585,804	3,318,193	3,416,974
4th Qtr.	33,491	302,083	23,864	4th Qtr.	4,214,477	4,516,934	15,675,604	15,969,824
Total	1,831,755	4,124,668	141,905	Total	14,154,696	15,676,991	72,389,376	75,674,634
1990/91				1990/91				
Sept.				June	603,614	691,947	6,675,422	6,766,369

1/ Corn includes grain only (yellow dent corn, other), seed, and cornmeal. Sorghum is grain only. Barley includes grain only barley for malting, other), pearl barley, milled and malting. Oats include grain (hulled or unhulled), unhull oats fit and unfit for human consumption, and oatmeal fit for human consumption.

Source: Bureau of the Census, U.S. Department of Commerce.

Appendix table 16--Shipments of grain on the Illinois Waterway and the Mis

Crop year	Sept.	Oct.	Nov.	Dec.	Jan.
					Milli
1981/82	3.4	3.4	4.6	3.9	1.2
1982/83	4.1	3.2	4.2	3.2	2.7
1983/84	5.3	4.9	5.7	4.4	1.0
1984/85	3.1	4.6	5.5	3.1	2.0
1985/86	2.4	2.6	4.3	3.3	1.8
1986/87	3.2	3.1	5.2	2.4	1.2
1987/88	3.3	3.8	3.9	2.9	1.9
1988/89	3.3	3.3	3.9	3.5	1.7
1989/90	3.0	3.9	4.7	2.5	2.2

Source: Mississippi River Barge Traffic, U.S. Army Corps of Engineers, R

Appendix table 17--Barge rates for grain shipments to New Orleans, Louisia

Crop year	Origin	Sept.	Oct.	Nov.	Dec.	Jan.
1984/85	Peoria, IL	7.77	8.07	6.71	5.79	7.3
	St Louis, MO	5.94	5.92	5.15	3.98	4.3
1985/86	Peoria, IL	5.26	7.93	6.48	9.08	7.2
	St Louis, MO	4.32	6.42	4.80	5.35	4.3
1986/87	Peoria, IL	8.37	10.54	6.64	5.16	4.9
	St Louis, MO	6.52	7.52	5.06	3.62	3.2
1987/88	Peoria, IL	8.66	9.04	7.38	5.68	7.3
	St Louis, MO	6.58	6.97	5.73	4.29	4.3
1988/89	Peoria, IL	9.80	10.32	7.88	8.81	7.3
	St Louis, MO	7.91	8.35	5.94	6.11	5.1
1989/90	Peoria, IL	5.89	10.49	10.87	12.15	9.1
	St Louis, MO	4.64	7.90	6.84	7.05	5.2

1/ Assumes all traffic on the Illinois River originates at Peoria, IL.

Source: Based on rates reported by Transportation Situation, Illinois D

e Mississippi River (Locks 11-22), 1981/82-1989/90

Feb.	Mar.	Apr.	May	June	July	Aug.	Average
Million tons							
0.8	2.1	4.1	3.8	4.4	3.9	5.0	3.4
2.3	3.8	3.3	3.9	4.2	4.2	4.8	3.6
3.6	4.5	5.3	4.4	3.7	3.4	3.3	4.1
0.9	3.1	4.1	3.1	3.2	3.4	3.0	3.3
1.7	2.9	3.4	3.6	3.2	2.5	3.3	2.9
1.7	3.6	3.8	4.0	3.8	2.8	3.5	3.2
2.0	3.0	4.2	4.3	3.6	2.7	3.3	3.2
1.5	2.6	3.5	4.3	4.1	3.9	3.4	3.3
2.2	3.5	4.5	5.2	4.5	5.0		3.7

rs, Rock Island District.

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Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Average
	--Dollars per ton--							
7.34	6.87	5.73	5.08	4.33	4.76	4.83	4.63	5.99
4.36	4.20	3.88	3.79	3.29	3.39	3.34	3.64	4.24
7.22	5.64	4.28	4.13	3.90	3.70	3.70	6.21	5.63
4.39	3.87	3.18	3.14	2.97	2.99	2.96	4.62	4.08
4.95	5.23	6.96	5.88	5.44	6.16	6.15	6.46	6.50
3.28	3.52	5.27	4.54	3.77	4.30	4.37	4.99	4.73
7.32	6.89	8.16	7.25	6.19	9.86	9.79	7.61	7.82
4.39	4.59	6.13	5.47	4.65	7.56	6.81	6.46	5.80
7.32	7.26	7.08	5.85	5.34	6.13	4.92	5.13	7.15
5.19	5.31	5.40	4.18	3.72	4.44	3.68	3.92	5.35
9.13	7.32	6.43	7.70	6.43	5.47	4.56		7.86
5.23	5.07	4.92	5.64	4.82	3.99	3.22		5.39

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ois Dept. of Agriculture.

Appendix table 18--Weekly average of rail car loadings of grain and soybe

Year	Sept.	Oct.	Nov.	Dec.	Jan.	Fe
						Carlo
1979/80	28,576	32,118	32,558	30,500	30,504	31,
1980/81	32,127	24,114	31,450	28,106	34,396	31,
1981/82	25,607	25,609	27,419	22,384	22,967	27,
1982/83	20,321	29,523	25,350	21,888	24,700	26,
1983/84	29,735	31,414	29,515	25,927	31,068	29,
1984/85	29,162	24,482	28,587	25,441	25,310	23,
1985/86	18,889	26,227	28,214	23,482	25,424	22,
1986/87	27,329	33,605	29,877	24,827	23,086	26,
1987/88	32,977	32,820	29,947	29,225	32,223	34,
1988/89	29,014	30,628	27,140	27,120	30,324	30,
1989/90	24,364	28,894	31,721	29,422	32,691	32,

Source: Association of American Railroads.

Appendix table 19--Rail freight rate index for grain, crop years 1979/80
(December 1984=100)

Year	Sept.	Oct.	Nov.	Dec.	Jan.	F
1979/80	64.2	69.5	69.6	70.2	70.2	
1980/81	78.3	78.8	78.8	79.2	83.1	
1981/82	88.5	89.4	89.4	89.4	93.6	
1982/83	93.0	93.0	93.0	93.0	93.9	
1983/84	93.9	94.2	94.2	94.2	98.0	
1984/85	98.4	100.0	100.0	100.0	100.0	1
1985/86	98.0	98.0	98.0	98.0	98.9	
1986/87	99.2	98.5	98.5	97.8	98.3	
1987/88	98.9	99.2	99.1	98.5	101.2	1
1988/89	109.3	108.3	108.5	108.2	109.2	1
1989/90	108.4	108.6	108.7	108.7	109.1	1

NA = Not available.
Source: Bureau of Labor Statistics, U.S. Dept. of Labor.

soybeans, 1979/80-1989/90

Feb.	Mar.	Apr.	May	June	July	Aug.	Average
Carloads							
31,025	30,170	26,546	23,606	28,333	32,584	32,921	29,953
31,108	27,657	23,490	21,291	28,014	22,162	26,152	27,506
27,220	26,813	25,798	23,755	22,540	27,020	25,123	25,188
26,318	26,807	21,243	20,849	21,393	27,942	27,461	24,483
29,105	27,666	26,784	23,616	24,335	26,632	29,848	27,970
23,688	23,340	20,164	17,715	24,724	22,662	20,218	23,791
22,558	20,648	17,743	17,673	24,907	24,426	24,342	22,878
26,663	27,134	25,046	26,189	32,154	32,257	30,825	28,249
34,224	34,241	32,963	30,861	33,316	29,678	27,010	31,624
30,583	31,436	30,181	25,943	27,253	25,095	25,905	28,385
32,378	29,486	27,938	25,775	27,945	25,609		28,748

79/80-1989/90

Feb.	Mar.	Apr.	May	June	July	Aug.	Average
71.4	70.5	72.7	72.8	73.3	76.6	76.9	71.5
84.1	85.0	84.8	84.8	85.7	88.0	88.5	83.3
93.6	93.6	93.6	93.6	93.6	93.6	93.6	92.1
93.9	93.9	93.9	93.9	93.9	93.9	93.9	93.6
98.0	98.0	98.0	98.0	98.0	98.4	98.4	96.8
100.0	99.3	99.3	98.7	97.3	96.4	96.3	98.8
99.0	99.0	99.1	99.2	99.2	99.2	99.2	98.7
98.3	98.8	98.6	98.5	98.6	98.6	98.5	98.5
101.2	101.4	102.7	104.1	104.3	106.4	109.3	102.2
109.2	108.8	108.8	108.8	108.0	108.4	108.4	108.7
109.1	109.1	110.3	110.0	108.9	109.0		109.1

Appendix table 20--Hay (all): Acreage, supply, and disappearance, 1984/85-1990/91

Item	Unit	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91 1/
Acreage harvested	Mil. acres	61.4	60.4	62.4	60.1	65.1	63.4	61.7
Yield per acre	Tons	2.45	2.46	2.49	2.45	1.94	2.29	2.40
Carryover (May 1)	Mil. tons	20.1	26.9	26.7	32.3	27.1	17.5	27.1
Production	"	150.6	148.6	155.5	147.5	126.0	145.4	148.5
Supply	"	170.7	175.5	182.2	179.8	153.1	162.9	175.6
Disappearance	"	143.8	148.8	149.9	152.7	135.6	135.8	NA
Roughage-consuming animal units (RCAU's)	Mil. units	83.2	80.5	78.3	76.3	76.3	76.3	77.7
Supply per RCAU	Tons	2.05	2.18	2.33	2.36	2.01	2.13	2.26
Disappearance per RCAU	"	1.73	1.85	1.91	2.00	1.78	1.78	NA

1/ Preliminary.

Appendix table 21--Hay: Average prices received by farmers, United States by months, 1983/84-1990/91 1/

Year	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Average 2/
							$/ton						
Alfalfa:													
1983/84	83.80	78.30	77.40	77.40	79.10	82.40	80.10	81.70	82.00	85.10	84.40	84.30	81.33
1984/85	87.10	80.10	75.60	72.80	73.90	76.70	74.30	77.50	76.20	76.40	75.80	76.70	76.93
1985/86	85.50	74.90	72.50	68.10	70.70	70.50	67.70	69.10	70.20	71.30	72.00	69.80	71.86
1986/87	69.50	64.10	61.40	60.10	58.80	59.90	57.90	60.70	58.80	61.10	62.80	67.90	61.92
1987/88	76.30	66.90	65.10	66.30	67.60	67.70	63.70	67.40	66.50	69.60	72.50	76.90	68.88
1988/89	84.50	81.90	87.90	86.10	87.30	90.30	92.20	94.40	96.70	99.40	105.00	107.00	92.73
1989/90	107.00	99.80	90.60	87.70	90.70	92.20	91.70	91.70	93.50	94.10	96.90	99.10	94.58
1990/91	110.00	96.30 3/	93.50										
Other hay:													
1983/84	58.90	56.10	54.30	52.90	57.80	59.50	62.10	64.30	63.30	63.80	64.90	66.50	60.37
1984/85	64.90	63.40	61.80	61.40	60.90	62.40	62.00	62.60	64.80	64.70	61.70	58.40	62.42
1985/86	58.70	54.00	57.00	58.40	58.60	58.20	55.30	56.00	56.10	56.00	54.80	54.90	56.50
1986/87	54.00	50.90	50.00	51.00	52.70	50.00	49.70	49.40	48.10	50.90	48.30	48.20	50.27
1987/88	51.90	50.80	49.60	51.00	51.80	51.10	52.30	51.10	52.20	51.50	51.70	51.90	51.41
1988/89	59.30	62.00	65.10	68.10	68.90	69.00	70.00	69.50	70.00	72.10	73.60	76.70	68.69
1989/90	78.30	67.50	63.70	63.50	65.90	62.40	62.60	63.30	66.00	66.00	68.40	65.60	66.10
1990/91	67.30	64.00 3/	65.60										
All hay:													
1983/84	78.10	72.70	71.20	71.20	74.70	76.80	75.10	76.70	76.60	78.70	79.40	79.80	75.80
1984/85	82.50	76.10	72.40	70.40	70.70	73.10	71.40	73.40	73.00	73.10	72.20	72.50	72.70
1985/86	80.80	70.20	67.90	65.20	67.10	67.50	64.30	65.40	65.80	66.70	67.10	66.20	67.60
1986/87	66.70	61.00	58.80	58.20	57.60	57.90	56.00	57.70	56.10	58.50	59.20	64.10	59.70
1987/88	71.70	62.90	61.20	62.70	64.10	64.20	61.10	63.20	62.80	64.60	67.20	71.40	65.10
1988/89	79.70	77.00	81.60	81.40	82.90	85.10	86.40	87.60	89.50	91.80	96.90	101.00	85.20
1989/90	103.00	93.30	84.40	81.90	84.70	85.10	83.60	83.10	85.00	85.60	88.50	91.60	86.00
1990/91	101.00	87.80 3/	85.60										

1/ Prices reported for mid-month. 2/ U.S. season average prices weighted by monthly marketings for all hay. 3/ Preliminary.

Source: Agricultural Prices, Agricultural Statistics Board, USDA.

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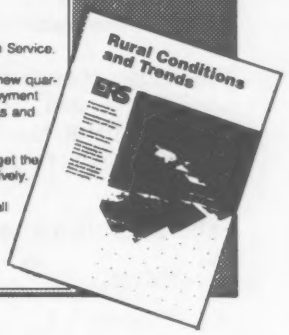

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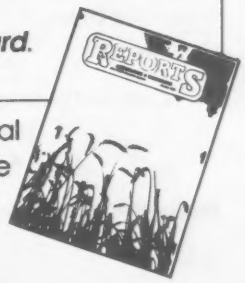

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